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THE

CONNECTION

BETWEEN

GEOLOGY AND THE MOSAIC HISTORY OF THE CREATION.

BY

EDWARD HITCHCOCK,

PROFESSOR OF CHEMISTRY AND NATURAL HISTORY

IN AMHERST COLLEGE.

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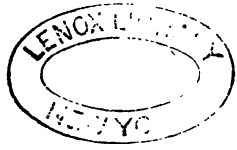

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THE

CONNECTION

BETWEEN

GEOLOGY AND THE MOSAIC HISTORY OF THE CREATION.*

EVERY nation in all ages has had its recorded or traditional cosmogony. And it is not a little curious, that a subject which the most improved philosophy, aided by a Divine revelation, finds it so difficult to understand and illustrate, should so interest men in all stages of civilization, and be even incorporated into the unwritten poetry of the rudest tribes. Men of all religions too, and those hostile to all religion; the pagan, the Christian, the deist, and the atheist, have regarded cosmogony as a storehouse of tried arguments for the support of their opposing opinions. Ever since the introduction of Christianity into the world, this has been a portion of the field of contest between its friends and its enemies, where the battle has warmly raged. Many a friend of revelation, even before geology was known as a science, has fancied that he saw in the structure of our globe, a demonstrative confirmation of the Mosaic history: while many an infidel has seen with equal clearness, in those same natural

* A lengthened and able discussion, embracing the opposing theories on this interesting subject, by Rev. W. D. Conybeare, and others, will be found in the Christian Observer for April, May, June, August, and September, 1834.

monuments, a refutation of the sacred record. And this is one of those subjects about which men are clear and positive, just in proportion to the looseness and superficialness of their knowledge. The consequence has been, that the world has been flooded with a multitude of very weak and crude productions upon cosmogony. At the beginning of the last half century, indeed, these productions, called "Theories of the Earth," had become so ridiculous, that, for a number of years, the press was much less prolific on the subject. Since the commencement of the present century, however, the discussion has been revived with fresh interest; though it is not so much between the infidel and the Christian, as between Christian and Christian; the one defending, and the other opposing certain theories. And there seems to be prevalent, as in former times, a strange delusion, which makes almost every intelligent man fancy himself amply qualified to write upon these points with the most dogmatic assurance. Hence a multitude of productions have been poured forth on the community, many of which exhibit such a want of maturity, and such entire ignorance of some parts of the subject, that the men thoroughly versed in all its bearings have passed them by in pity or contempt. We, however, have caught the *cacoethes scribendi*, and must go on; though at the risk of having our efforts treated thus cavalierly, and cast into the same forgotten pile of literary rubbish.

We think it will explain the numerous failures of writers, on the connection between the Bible and geology, to state, that most of them have been merely theologians, or merely philologists, or merely geologists, or at best but slightly acquainted with more than two of these branches. Being accurately acquainted with one or two of these departments of knowledge, they have overlooked the importance of a thorough acquaintance with the rest. But it is quite clear to us, that without at least a respectable acquaintance with them all, no man can successfully discuss their connection, or reconcile their apparent discrepancies. If he be not familiar with theology, how can he judge correctly of those theories of interpretation,

which modify essentially every institution and doctrine dependant upon the Mosaic chronology? If he be not acquainted with the rules of exegesis, now constituting a distinct and extensive science, how shall he determine whether those theories do not offer violence to the sacred writers? And if he be ignorant of geology, how shall he know what modifications, if any, of the common interpretation of the Bible, are necessary to reconcile it with the records of nature's past operations? Nor is a mere theoretical knowledge of these subjects sufficient. Especially is this the case in geology; in which the fullest and most accurate descriptions convey but faint and inadequate ideas to the mind, in comparison with a personal examination of the rocks in the places where nature has piled them up.

We may inquire too, how readers are to judge of discussions on these subjects, if they have not at least a respectable acquaintance with the three departments of knowledge above named? Now, in regard to theology, and sacred philology, we may reasonably calculate, from the provisions that are made in our seminaries of learning for teaching them, that all publicly educated men, at least, will be conversant with their elements. Nor is any such man respectable in society without this knowledge. But far different is the case in respect to geology. What provision is there in our literary institutions for teaching any thing more than its merest elements by a few lectures? and who feels any mortification in confessing his ignorance of the subject? Were not the community in general profoundly unacquainted with its details, so many statements, contradictory to its first principles, could not pass so quietly as they now do the round of our newspapers and periodicals. Some of our geologists, we happen to know, have been discouraged by the evidence they have seen of so much ignorance on the subject, from attempting to explain or defend the principles of their science when attacked; being quite sure that their statements would neither be understood nor appreciated. In the most enlightened parts of Europe, the case is quite different. "In England, every enlight-

ened man knows something of geology: it is very much the case in France; and is becoming more and more so in Germany." * We rejoice, however, in the belief, that the state of things in this country, on this subject, is rapidly improving.

Notwithstanding these discouraging circumstances, we propose to examine carefully, the connection between geology, and the Mosaic cosmogony. The two records have been, and still are supposed to be at variance: and to ascertain whether this opinion be correct, will be the great object of inquiry. If they both proceed from the same infinitely perfect Being, there cannot be any real discrepancy between them. So that if we discover any apparent disagreement, we either do not rightly understand geology, or give a wrong interpretation to the Scriptures, or the Bible is not true. We hope to show, to the satisfaction of every reasonable and candid mind, that we are by no means compelled to adopt the last of these conclusions. Nevertheless, we forewarn our readers, that if any of them expect that we shall remove all difficulties from the first chapter of Genesis, they will be disappointed. Independent of geology, there are obscurities in that portion of Scripture, which no interpreter has ever been able entirely to remove; nor in the present state of geological science, are we warranted in presuming that no future discoveries will throw any light upon the Mosaic cosmogony. All that can be reasonably expected of a writer on this subject, and all that we shall attempt, is, to show, that there are modes of reconciling the Mosaic and the geological records, so reasonable, that to disbelieve the former on account of apparent discrepancies, would be altogether unjustifiable, and even absurd. We have our preferences as to the best mode of reconciling the two histories; nor shall we conceal our partiality: but we shall not undertake to defend any particular mode as infallibly true; because we do not believe that such positiveness is necessary for the defence of the sacred record, or justified by the present state of our knowledge.

* American Quarterly Review, June, 1830, p. 363.

We venture to make another suggestion to our readers. Let no one, however intelligent, imagine that the mere perusal of the best written essay can make him master of this subject. It is only by long and patient thought, as well as extensive reading, that he will be able correctly to appreciate all its bearings, and to plant himself on ground that will not be continually sliding from beneath his feet.

It is very common for writers on this subject, to confine their attention to the single point, where there is a supposed disagreement between geology and revelation: whereas, in order to form a correct judgment concerning such disagreement, we ought to look at all the points where the two subjects are connected. For if we find discrepancy to be generally manifest, and agreement to be only an exception, the presumption is strong, that a particular marked discrepancy is real and irreconcilable. But if harmony constitutes the rule, and disagreement the exception, the presumption is, that any special case of the want of coincidence, results from ignorance or misunderstanding.

Now we think that we can point out a number of coincidences between geology and revelation, some of which are unexpected and remarkable. And it will constitute the first part of our effort to exhibit these coincidences in detail.

1. *In the first place, geology and revelation agree in teaching us that the material universe had a beginning, and was created out of nothing, by a Divine Power.*

In treating of the connection between geology and natural theology,* we have shown how the successive groups of animals and plants that have been placed on the globe, have been more and more perfect and complicated, so that in tracing them backwards, we must at length arrive at the beginning of the series. A similar retrospective survey of the changes which have taken place in the matter composing the globe, brings us at length to a point, anterior to which, no change can be

* Students' Cabinet Library of Useful Tracts, No. II.

discovered. And we maintain that it is philosophical to infer that the creation of matter took place at the commencement of such a series of changes, and of animal and vegetable existences. At least, it is unphilosophical, without proof, to infer the existence of matter through the eternity that preceded these changes: and no proof can be presented, unless it be derived from the nature of matter; an argument too tenuous to have influence with substantial minds. But the creative power which was put forth at the commencement of these changes, in the formation of animals and plants, is a presumption in favour of its having been previously exerted in the no more difficult work of bringing matter into being.

We are aware that not a few distinguished critics and theologians do not regard Moses as describing in the first chapter of Genesis, a creation of matter out of nothing, because the words employed are ambiguous in their signification. This point we shall examine carefully, further on. But we cannot doubt, after an examination of all the passages in the Bible where the creation is spoken of, that the sacred writers most clearly intended to teach the creation of the universe out of nothing, (creatio *prima*, vel *immediata*, in the language of the theologians) and not out of pre-existing materials: (creatio *secunda*, vel *mediata*).

When we consider how strong a tendency has ever been exhibited by learned men to a belief in the eternity of matter, and how some philosophers, and even divines, at this day maintain that belief,* we cannot but regard the testimony of geology on this point as of great importance. And, if we mistake not, it will be in vain to search the records of any other science for proof equally conclusive.

2. *In the second place, revelation and geology agree as to the nature and operation of the agents that have been employed in effecting the changes which have taken place in the matter of the globe since its original creation.*

These agents are fire and water: and at almost every step, the geologist meets with evidence of their combin-

* Knapp's Theology, Vol. I. p. 341.

ed or successive operation within, and upon our globe. The deposition of the stratified rocks he cannot explain without the presence of water; especially when he finds them filled with the relics of marine animals. But their subsequent elevation and dislocation, as well as the production of the unstratified rocks, demanded the agency of powerful heat.

To the cursory reader, water appears to have been the principal agent employed in the revealed cosmogony; and in subsequent times, the same agent was employed for the destruction of the world. But a careful examination of the Scriptures, renders it at least probable, that fire was concerned in some of the demiurgic processes. There can be no doubt, but under the term אוֹר, (lux) Moses includes both light and heat, or fire; since he does not describe the latter as a separate creation, and since it is now understood that they always are united, and are in fact probably only different modifications of the same principle. Now, although Moses does not distinctly exhibit heat as an agent in modifying the face of the globe, yet there is a passage in the 104th Psalm, which quite obviously points us to such an agency. *Thou coveredst it* (the earth) *with the deep, as with a garment: the waters stood above the mountains. At thy rebuke, they fled; at the voice of thy thunder, they hasted away.* Here we have a description of that change in the earth's surface, which, in Genesis, is thus described: *And God said, let the waters under the heaven be gathered together unto one place, and let the dry land appear; and it was so.* Moses does not describe the agent employed in this change; but refers it to the immediate power or command of God. But if there be any fact clearly established in geology, it is, that all dry land on the earth has been elevated above the waters by a volcanic agency: using that term in its widest signification, to denote the "influence exercised by the interior of a planet on its exterior covering, during its different stages of refrigeration."* Now, how appropriate to re-

* Humboldt's definition: De la Beche's Manual of Geology, 2nd London Edition, p. 518.

present such an agency in operation, as the voice of God's thunder, from which the waters hasted away.

That this is a natural interpretation of the Psalmist's language, will be obvious, by quoting the commentary of Bishop Patrick, upon the third day's work of creation: an author, whose exegesis, although prepared more than 150 years ago, is often remarkably adapted to the state of natural science in the nineteenth century. "There being such large portions of matter," says he, "drawn out of the chaos, as made the body of fire and air, beforementioned: there remained in a great body, only water and earth; but they so jumbled together, that they could not be distinguished. It was the work, therefore, of the third day, to make a separation between them, by compacting together all the particles which make the earth, which, before, was mud and dirt; and then by raising it above the waters which covered its superficies, (as the Psalmist also describes this work, Ps. civ. 6); and lastly, by making such caverns in it, as were sufficient to receive the waters into them. Now, this we may conceive to have been done by such particles of fire as were left in the bowels of the earth; whereby such nitro-sulphureous vapours were kindled, as made an earthquake, which both lifted up the earth, and also made receptacles for the waters to run into; as the Psalmist (otherwise I should not venture to mention this) seems in the forementioned place to illustrate it; Ps. civ. 7. *At thy, &c.* And so God himself speaks, Job xxxviii. 10, *I brake up, &c.* History also tells us of mountains, that have been, in several ages, lifted up by earthquakes; nay, islands in the midst of the sea: which confirms this conjecture," &c.*

The view which we have given above respecting the account in Genesis, is sustained by the opinion of Sharon Turner. "The Hebrew word used by Moses, אוֹר," says he, "expresses both light and fire. We may therefore reasonably infer, that light came to the earth in the state in which we now almost universally find it, both light and heat," &c.—"We learn from the book of Genesis, that

* Commentary on Gen. i. 9.

both these were active agents in the creation from its very commencement. Thus the great scientific truth so recently ascertained, after many contending systems had been upheld and thrown down, that both the watery and fiery elements were actively concerned in the geological construction of our earth, is implied or indicated by the Mosaic narration, instead of being inconsistent with it."*

The scholar cannot but be reminded by these remarks, of the Cataclysmi and Ecpyroses taught by the ancient Egyptians, and fully adopted by the Stoics. Must we not suppose that so wide-spread an opinion concerning successive catastrophes to which the globe has been subject, produced alternately by fire and water, like the traditions of a universal deluge, had its origin in the truth? Have we not here an interesting coincidence between the records of revelation, of civil history, and of geology? †

There is another similar coincidence which should not be passed unnoticed, especially as it is entirely overlooked by most readers of the Bible. Geological travellers describe the region around the Dead Sea in Palestine, as exhibiting decided marks of former volcanic action; and we can hardly doubt but that sea itself occupies the site of an ancient crater. Now, if we adopt Dr. Henderson's translation of a passage in Job, we can hardly doubt but that God did employ a volcanic eruption to overwhelm the cities of the plain:—

> "Hast thou observed the ancient tract,
> That was trodden by wicked mortals?
> Who were arrested of a sudden,
> Whose foundation is a molten flood;
> Who said to God, depart from us,
> What can Shaddai do to us?
> Though he had filled their houses with wealth:
> (Far from me be the counsel of the wicked!)
> The righteous beheld and rejoiced,
> The innocent laughed them to scorn;
> Surely their substance was carried away,
> And their riches devoured by fire." ‡

* Sacred History of the World, (Family Library,) pp. 24, 25.

† Lyell's Geology, Vol. I. p. 9; also Macculloch's System of Geology, Vol. II. p. 386.

‡ Henderson's Iceland, American Edition, 1831, p. 80.

The raining down of fire and brimstone accords perfectly well with the idea of a volcano, since those very substances, being raised into the air by the force of the volcano, would fall in a shower upon the surrounding region. Whether it was miraculously produced, or the natural operation of it employed by God to punish the wicked, it is not of much consequence to determine,—since the sacred writers, whose example we should copy, seem to regard every natural event as almost equally the work of God.

3. *Geology and revelation agree in representing the continents of our globe as having formerly been submerged beneath the ocean.*

At least two-thirds of existing continents are covered with rocks that contain abundant remains of marine animals; and the whole of their surfaces are overspread with such a coating of bowlders, pebbles, and sand, as proves the occurrence of deluges in former times, too mighty for any thing but the ocean to produce. Indeed, to doubt that our existing continents in early times formed the bottom of the ocean, is scepticism too gross for any geologist at this day to indulge, especially when he sees that the rocks are tilted up just as they would be if a volcanic force had lifted them above the waters.

I hardly need say that all this corresponds precisely with the Mosaic account. Until the third day it seems that the surface of the globe was one shoreless ocean. For the command that the dry land should appear, implies that previously it was covered; and from the second verse of Genesis we learn that it was covered by the *deep*. It was upon the waters that the Spirit of God moved.

4. *Revelation and geology agree in teaching us that the work of creation was progressive after the first production of the matter of the universe.*

Every step which the geologist takes in his examination of the crust of our globe, presents to his view fresh evidence that the formation of nearly all the rocks has been progressive. Every where on the earth's surface, he sees in operation the agency of rains, rivers, and deluges, to wear down the higher parts and to fill up the lower, where

he finds accumulated sand and gravel, with a mixture of animal and vegetable remains; and where water, containing lime or iron in solution, percolates through these deposites of detritus, they become hardened into stone. The mass thus hardened cannot be distinguished from the sandstones and conglomerates that cover large areas on the earth, and form mountains some thousands of feet in height. The observer cannot resist the impression, that all these rocks, whose characters are more mechanical than chemical, (*e. g.* the sandstone and conglomerates,) were produced in a similar manner. But it sometimes happens that such rocks, in particular localities, have been subject to the agency of powerful heat by means of former volcanoes; and there their mechanical aspect more or less disappears, and they are chrystaline in their structure, so as exactly to resemble the oldest or lowest rocks. Hence the geologist very reasonably infers, that even the oldest strata were originally mere beds of clay, sand, and gravel, which have been changed by volcanic agency, repeatedly and powerfully exerted upon them; and when he sees the unstratified rocks (now almost universally admitted to be the products of igneous agency) intruded among the older stratified ones in almost every possible mode, he is confirmed in the inference which he had made. In short, there is not probably a single rock yet brought to light in the crust of the earth, of which the geologist cannot find its prototype now actually forming on the land or in the sea; and they all bear the marks of progressive formation. Men in their studies may reason about the rocks, as if they were produced in their present state in a moment of time, by the original creative fiat of Jehovah; but they cannot examine them in their native beds without seeing at once that the opinion is utterly untenable.

Now it is an interesting coincidence with geology, that the Scriptures describe the work of creation as occupying six successive days. Whether we are to understand these as literal days of twenty-four hours, or whether geology demands a period longer than six natural days, are questions not necessary to be discussed in this place. The

argument requires only that it should be admitted, as all must admit, that Moses represents the work of creation as progressive. He does not, indeed, represent any new matter as brought into existence after "the beginning," in which "God created the heavens and the earth." He describes the animals and plants as produced out of pre-existing matter; and geology teaches the same.

5. *Geology and revelation agree in the fact that man was the last of the animals created.*

The geologist finds several thousand species of plants and animals entombed, and their forms preserved in the rocks; and some of them very far down in the series. But no remains of man occur until we arrive at the highest strata.* It is only in the loose sand and gravel that cover the surface that human remains have been found at all;† and to this day it is doubtful whether any of them can be referred to a period as far back as the last general deluge. At least, it is only in one or two instances that the bones of antediluvians have been exhumated. Now, human bones are no more liable to decay than those of other animals, and they are as easily petrified. Why then, if man existed with the animals now entombed in the secondary and tertiary rocks, are they not found as they are with postdiluvian remains? The conclusion is irresistible, that he was not their contemporary. And probably, before the last deluge, he scarcely existed out of Asia; and hence, among the antediluvian animals of America, England, and Germany, he has not been found. In the south of France only (unless perhaps in Belgium) have human remains been discovered, so connected with antediluvian quadrupeds as to render their existence at the same epoch probable. Man, therefore, must have been among the last of the animals that

* See Professor Stuart's answer to this statement, *Students' Tracts, No. XX.*

† The Gaudaloupe specimens, now in the English and French cabinets, are hardly an exception to this statement; for although found in solid rock, it is a rock which is continually forming at the bottom of the Caribbean seas, and these specimens are doubtless of postdiluvian origin.

were created; and it is needless to say that this conclusion coincides precisely with the revealed record.

6. *Geology and revelation agree in the fact that it is only a comparatively recent period since man was placed upon the earth.*

We have room to refer only to two or three proofs which force this conclusion upon the geologist.

The last great catastrophe that affected our earth almost universally, appears from the marks it has left on the surface, to have been a general deluge. Since that epoch, certain natural operations have been slowly and pretty uniformly in progress, so as to form an imperfect kind of chronometer. Among these is the accumulation of alluvium at the mouths of rivers, usually called *deltas*. In some parts of the eastern continents we are able to ascertain the progress of the work, from the situation of certain cities and monuments 2000 or 3000 years ago; and the conclusion is, that the beginning of the whole process cannot be dated further back than a few thousand years. And since human remains have scarcely been found in the diluvium of countries which geologists have yet examined, it cannot be that man had spread far on the earth's surface previous to the last deluge. Thus we are led to infer that the date of his creation could have reached back but a few thousand years.

The same conclusion is confirmed by the manner in which ponds and morasses are filled up by the growth of sphagneous mosses. This process is still going on; so that during the life of an individual, he can often perceive considerable progress towards the conversion of a morass into dry ground. But were not the present condition of the globe of rather recent date, all such processes must ere this have reached their limits.

Who has not observed, that where mountains rise into precipitous rocky peaks or ledges, with mural faces, in almost all cases there is an accumulation around their bases of fragments detached by the agency of air, water, and frost? Where the rock is full of fissures, indeed, these fragments sometimes reach to the very top of the ledge; but in general the work of degradation is still in

progress, and impresses the observer with the idea that its commencement cannot have been very remote.

I am aware that such facts do not very definitively fix the time of the beginning of the present order of things, because we cannot easily compare them with human chronology. But when we read in the Bible that it is only a few thousand years since man was placed upon the earth, we cannot but feel that these natural changes are in perfect coincidence with the inspired record, although alone they teach us only that their commencement was not very remote. Had deltas been pushed across wide oceans, or morasses been all filled up, or mountains been all levelled, we should at once perceive a discrepancy between revelation and nature. Now both of them proclaim the comparatively recent beginning of the present order of things on the globe, in the face of the hoary chronologies of many nations.

7. *Geology and revelation agree in representing the surface of our globe as swept over by a general deluge at a period not very remote.*

Many distinguished geologists maintain that the Mosaic account is strongly confirmed by geology. Others merely say that the globe exhibits evidence of many deluges in early times, but that no one of them can be identified with the Noachian deluge. All will agree, however, (except perhaps some violent infidels,) that geology affords in these marks of former deluges a presumptive evidence in favour of the one described by Moses. In this place we maintain only, that in respect to a general deluge, geology strictly accords with revelation; and considering the nature of such an event and its rare occurrence, this coincidence must be regarded as highly interesting.

8. *Finally, geology furnishes similar confirmatory evidence as to the manner in which revelation declares the earth will at last be destroyed.*

Recent discoveries and reasonings have rendered it probable that the internal parts of the earth still contain an immense amount of heat, sufficient, in the opinion of some, to keep the interior in a melted state, and sufficient, whenever God shall permit it to break from its

prison, " to melt the elements and burn up the earth, and the things therein." Geology also renders it probable, that the consequence of such a catastrophe would be the formation of " a new heavens and a new earth." But we have no time at present to give a more full developement of these ideas suggested by modern geology.

Now, in respect to the coincidences between geology and revelation that have been pointed out, they are for the most part such as no human sagacity could have invented at the time the book of Genesis was written; for it is only by the light of the nineteenth century that they have been disclosed. We ought therefore to bear in mind, when we examine any apparent discrepancies between geology and revelation, that there exist between them many unexpected coincidences. In other words, we ought not to forget that even from geology alone we derive presumptive evidence in favour of the sacred historian. The evidence of disagreement, therefore, must be very clear and strong, to justify us in rejecting the Mosaic cosmogony as false.

Having, in the former part of this inquiry, prepared the way, by pointing out several unexpected coincidences between the two subjects, we are now prepared, as the second part of the discussion, to inquire into the nature, and means of reconciling the supposed discrepancy between geology and revelation.

This alleged disagreement is chiefly chronological. Moses represents the work of creation as completed in the space of six days; whereas the geologist asserts that the formation of the crust of the globe, with its numerous groups of extinct animals and plants, after the original production of the matter of the globe, must have occupied immense periods of time, whose duration we cannot estimate. Other minor discrepancies between the two records are supposed to exist. But we can conveniently notice them all in examining the chronological difficulty.

It is important to ascertain whether this demand of the

geologist for such indefinite periods of time, be really called for by the established facts of his science. These facts are principally derived from the fossiliferous rocks: that is, such rocks as contain organic remains, and appear to have been formed, in part at least, by mechanical agencies.

1. More than two thirds of existing continents are covered with these rocks; which contain numerous remains of marine animals, so preserved as to prove incontestibly that they died on the spot where they are now found, and became gradually enveloped in the sand, or other stony matter, which accumulated around them, their most delicate spines and processes being preserved. In fine, these rocks present every appearance of having been formed, just as sand, clay, gravel, and limestone are now accumulating in the bottom of the ocean, by a very slow process. Except in extraordinary cases, indeed, it requires a century to produce accumulations of this kind even a few inches in thickness.

2. But geologists think they have ascertained that the fossiliferous strata in Europe are not less than eight or ten miles in thickness: How immense the period requisite for the production of such vast masses!

3. This mass is divided into hundreds of distinct strata, or groups of strata; each group containing peculiar organic remains, and arranged in as much order, one above another, as the drawers of a well regulated cabinet. Such changes, not only of mineral composition but of organic remains, show that there must have been more or less of change of circumstances in the waters from which the successive strata and groups were deposited. And such changes must have demanded periods of time of long duration, for they appear to have been for the most part extremely slow. We hence derive confirmatory evidence of the views that have been presented concerning the vast periods that have been employed in the production of the fossiliferous strata.

4. Another circumstance still further confirms these views. In very many instances, each successive group of the strata above referred to, contains rounded pebbles

derived from some of the preceding groups. Those strata, then, from which such pebbles were derived, must not only have been deposited, but consolidated and eroded by water, so as to produce these pebbles, before the rocks now containing them could have been formed. It is impossible that such changes, numerous as they must have been, could have taken place in short periods of time. There must certainly have been long intervals between the formation of the successive groups.

5. The history of the repeated elevations which the strata have undergone, conducts us to the same conclusion. Different unstratified rocks have been intruded among the stratified ones of various epochs, and the strata have been elevated at each epoch. But the oldest strata were partially elevated before the newer ones were deposited: for the latter rest in an unconformable position upon the former. Indeed, we often find numerous groups of strata resting unconformably upon one another, the lowest being most tilted up, the next higher less so, and the third still less, until the latest is frequently horizontal; having never been disturbed by any internal protruding agency. It is obvious, then, that after the first elevation of the lowest group, there must have been an interval of repose sufficiently long to permit the deposition of the second group, before the second elevation; then a second period of repose, succeeded by a third elevation; and so on to the top of the series. Here, then, we have the same evidence of the slow formation of the stratified rocks, as is taught us by their lithological characters, and their organic remains.

It is impossible to exhibit the preceding arguments in a light as striking as they present themselves to the practical observer. Such a person, indeed, needs no laboured argument to satisfy him, that if the stratified rocks were deposited in the manner the work is now going on, immense periods of time were requisite. Even if he admit, what we are not disposed with some geologists to deny, that the causes now in operation did formerly act with greater energy than at present, yet he will still see the necessity of allowing periods of time vastly extended

to form the fossiliferous rocks, unless he admit, without any proof, that the laws of nature have been changed. God could, indeed, have performed the work miraculously, in a moment of time: But the supposition is wholly gratuitous, and even worse than this, as we shall show in the proper place. It is one thing to admit what God *can* do, and quite a different thing to show what he *has* done.

There is one geological fact, however, adduced by those who deny these long periods, that deserves attention. In the coal formation, large stems of vegetables, from 30 to 80 feet long, have been found standing upright, or somewhat inclined, and perforating the strata nearly at right angles. Hence it is inferred, that the strata of that thickness were deposited around these trunks, during a comparatively short period; as they must have decayed ere many years, if left exposed.

This fact certainly deserves very serious consideration. Geologists have usually explained it by supposing that gravity alone would cause the lower portion of *water-logged* stems to subside in loose mud and sand, so as to bring them, more or less, into a vertical position. Yet it is hardly conceivable, that a stratum even fifty feet thick, should continue in all its parts, from century to century in a semi-fluid state, so as to permit such a subsidence of the trunks: though we know of no facts that show how long it may remain in that state; nor how long *water-logged* stems may resist decomposition. But why not admit that in some cases there may be a very rapid accumulation of detritus in particular places; so that even in the course of a few years, a deposition may take place sufficiently thick to surround these stems? Suppose they happen to be situated at the mouth of a rapid river, coming from a mountainous region, and liable to repeated floods. It is well known that, in such cases, the accumulation of detritus is very rapid. Thus the Rhone has formed a delta in the lake of Geneva, within the last 800 years, two miles long and from 600 to 900 feet thick; and the delta of the Po has advanced 18 miles within the last 2000 years. * But these facts do not

* Lyell's Geology, Vol. I. p. 236. seq.

prove that, taken as a whole, the deposition of detritus over large areas is not a very slow process. The whole ocean has not probably been raised a single inch, since the creation of man, by the detritus of rivers; and even inland seas and lakes become shallow so slowly, that hitherto man has scarcely been able to measure it. In short, were we even to admit that the case of these upright stems in the coal fields did prove a more rapid rate of deposition of rocky matter in early times than at present, yet in ninety-nine cases out of a hundred, the evidence is the other way; and this would be regarded only as one exception in a hundred.

6. Finally, there appear to have been several almost entire changes of organic life upon the globe since the deposition of the fossiliferous rocks began. And comparative anatomy teaches us, that so different from one another were the successive groups which we find in the different strata, that they could not have been contemporaries. But each group appears to have been adapted to the condition of the globe at the time; and it was continued apparently, until by the extremely slow process of refrigeration, the temperature was rendered unfit for their residence, when they became extinct, and a new creation arose. But they lived long enough for rocks thousands of feet in thickness to be deposited, which now contain their remains. Who can doubt that vast periods of time were requisite for such changes of organic life? and who can believe that they have taken place since the creation of man?

We have dwelt thus long upon this point because of its importance. For if there is not the most conclusive evidence in geology of the existence of the globe longer than the common interpretation of the Mosaic history admits, we need not surely spend time in reconciling the two records. We cannot, however, but believe, that every impartial mind, which fairly examines this subject, will be forced to the conclusion, that the facts of geology do teach as conclusively, as any science not founded on mathematics can teach, that the globe must have existed during a period indefinitely long, anterior to the creation

of man. We are not aware that any practical and thorough geologist doubts this, whatever are his views in respect to revelation. Some writers on geology, indeed, who have studied the subject only in books, and are little else than compilers, have taken different ground: But of how little weight must the opinion of such men be regarded, when set in opposition to the unanimous voice of such men as Cuvier, Humboldt, Brongniart, Jameson, Buckland, Sedgwick, Murchison, Conybeare, Greenough, Bakewell, Lyell, Mantell, De la Beche, and many more; who not only stand among the most distinguished philosophers of the present day, but—many of them at least—are equally well known as decided friends of revelation. Unless the evidence were very strong, there would be found among so many of different education and professions at least one dissenting voice: but there is none.

We must then meet this difficulty in some other way than by denying the facts.

"Let us for a moment suppose," says Professor Sedgwick, himself a clergyman, and one of the ablest geologists of the present day, "that there are some religious difficulties in the conclusions of geology. How then are we to solve them? Not by making a world after a pattern of our own—not by shifting and shuffling the solid strata of the earth, and then dealing them out in such a way as to play the game of an ignorant or dishonest hypothesis—not by shutting our eyes to facts, or denying the evidence of our senses: but by patient investigation, carried on in the sincere love of truth, and by learning to reject every consequence not warranted by direct physical evidence. Pursued in this spirit, geology can neither lead to any false conclusions, nor offend against any religious truth. And this is the spirit with which many men have of late years followed this delightful science. But there is another class of men who pursue geology by a nearer road, and are guided by a different light. Well intentioned they may be, but they have betrayed no small self-sufficiency, along with a shameful want of knowledge of the fundamental facts they presume to

write about: hence they have dishonoured the literature of this country by *Mosaic Geology*, *Scripture Geology*, and other works of cosmogony with kindred titles, wherein they have overlooked the aim and end of revelation, tortured the book of life out of its proper meaning, and wantonly contrived to bring about a collision between natural phenomena and the word of God. The Buggs and the Penns—the Nolans and the Formans—and some others of the same class, have committed the folly and the sin of dogmatizing on matters they have not personally examined, and, at the utmost, know only at second hand—of pretending to teach mankind on points where they themselves are uninstructed." *

Before we proceed to examine the different theories of reconciliation between geology and scripture, that have been proposed, a few other preliminary considerations must be presented.

We must first decide whether geological facts can ever be permitted, as facts derived from civil history and astronomy are, to modify our interpretation of the sacred record. The Scriptures speak of the rising and setting of the sun; but astronomy shows us that they employ such language in accordance with optical, not physical truth. And the cases are too common to need particularizing, where the interpretation is essentially modified by civil history. Why should there be any question, then, whether geological facts ought to have the same influence in exposition? For so far as it bears on revelation, geology is in fact nothing but a history of the globe anterior, for the most part, to the commencement of civil history. The only reason that has ever been alleged for refusing to use geological facts in this way, is, that they are too uncertain. But although true, a half century ago, the fundamental facts of this science may now be regarded as resting on as firm a foundation, and to be as well understood, as those of any science not strictly demonstrative. The principles of sound criti-

* Sedgwick's Discourse on the Studies of the University, p. 149, 150. London, 1834.

cism, therefore, demand that they should be admitted equally with civil history and astronomy, as aids in the interpretation of the Bible.

In the examination of this subject, it ought to be borne in mind, that, independent of geology, much of the first chapter of Genesis has ever been an occasion of great perplexity—a *locus vexatissimus*—to critics. One has only to look into such a work as Poole's Synopsis Criticorum, to be satisfied that geology has scarcely added any thing to the diversity of opinion among commentators respecting the Mosaic cosmogony. Indeed, some of those very interpretations for which certain geologists now contend, as necessary to reconcile Scripture and their science, and which have excited so much jealousy and violent opposition among able religious writers, are to be found in commentaries written long before geology was known as a science; as we shall have occasion to show in the course of our observations. It might even be shown, we think, that geologists have not advanced *any* new theories of exegesis.

It has always, for instance, been a point in debate, whether the first chapter of Genesis must not in whole or in part, be understood figuratively. Another disputable point has been, whether Moses fixes the time of the original creation of the universe, or only that of the human race. Bishop Patrick, more than a hundred and fifty years ago, contended as ably and as earnestly as any modern geologico-theological writer, for the interpretation which leaves a long indefinite period anterior to man's creation for the gradual formation of the earth's crust; as we shall show further on. A third point still more earnestly contested from the Christian era to the present, is, whether Moses describes a creation of the universe out of nothing, or from pre-existing materials. Philo maintained the latter, and that בָּרָא describes an *arrangement*, not a *creation* of matter. Justin Martyr asserts it as the doctrine of Christians in his time, Πάντα τὴν ἀρχήν, ἀγαθόν ὄντα δεμιουργήσαι αὐτόν [Θεόν] ἐξ ἀμόρφου ὑλης διδάγμεθα.. He says, also, that Plato, who suppos-

ed the world created out of pre-existing matter, borrowed his doctrine from Moses. In modern times this opinion has prevailed very extensively, apart from all geological facts. Michaelis gives to בָּרָא the sense of the Latin *pario:* Dr. Geddes that of *paro.* "Whether the Mosaic creation," says Professor Schmucker,* "refers to the present organization of matter, or to the formation of its primary elements, it is not easy to decide. The question is certainly not determined by the usage of the original words (בָּרָא, עָשָׂה) which are frequently employed to designate mediate formation."

Every philologist knows what pains have been taken by father Simon, one of the ablest oriental scholars of his age, to prove that בָּרָא does not necessarily imply *to make out of nothing;* in which position he is undoubtedly correct; and the same may be shown in respect to the Greek ποιέω, the Latin *creo*, the English *create*, and the correspondent verb in perhaps every language. But Simon by no means stops here. He endeavours to show that the Hebrew language is so equivocal and ambiguous in its meaning, that we can have no confidence that we have ever found out the true sense. "We ought," says he, "to regard it as unquestionable, that the greater part of the Hebrew words are equivocal, and that their signification is *entirely* uncertain. There is *always* ground to doubt whether the sense which the translator gives to the Hebrew words be the true sense, because there are other meanings which are equally probable."†

Simon's object in advancing a position, which every tyro in philology sees at once to be absurd, was evidently to promote the cause of Catholicism, or of Rationalism, or of both; he having been ostensibly a Catholic, but

* Elements of Popular Theology, p. 110. Andover, 1834.

† On doit supposer comme une chose constante, que la plus part des mots Hebreux sont equivoques, et que leur signification est *entierement* incertaine.—Il y a *toujours* lieu de douter, si le sens qu'on donne aux mots Hebreux est le veritable, puis qu'il y en a d'autres qui ont *autant* de probabilite.—*Hist. Crit. du V. T. Liv.* 3. *Ch.* 2.

really a Socinian, or a Deist. But so distinguished a critic would not have dared to advance such an opinion, had there not been some specious argument in its favour; and such arguments he found in the difficulty which we have shown to be always connected with the interpretation of some portions of Genesis.

A fourth point on which there has been a diversity of opinion among commentators, is, whether the sun and moon were created on the first or the fourth day. The first opinion has had the greatest number of advocates; and a variety of hypotheses have been proposed to reconcile it with the assertion in ver. 14, that on the fourth day God made great lights, &c. On ver. 3, Poole says,* that "the Hebrews understand light here to refer to the sun, and that the declaration that it was created on the fourth day is by way of repetition. Among the learned the opinion is, that the light being obscure and not separate, was afterwards rendered brighter by the creation of the sun." (Vatablus)—"† It seems to have been only the quality of light diffused over most of the heavens, out of which, by condensation, the sun and stars were afterwards created." (Estius)—"‡ It seems to have been a lucid body, perhaps a bright cloud, which, having a circular motion, produced day and night, and out of which the sun was formed by condensation."

The result of these statements is, not that Moses has made his history a chaos of ambiguities, but that, like many other parts of Scripture, it contains *some things hard to be understood*, and especially upon those points with which geology is most concerned. Let it not therefore be thought very strange, that upon such points there should be some apparent discrepancies between the two

* Gen. 3. Lux. Hebraei de Sole accipiunt; quod autem quarto die creatus, per repetitionem dici volunt Doctioribus est, lux subobscura, nec absoluta, quae postea creato Sole illustrior reddita sit.

† (Vatablus)—Videtur fuisse ipsa qualitas lucis magna coeli diffusa, exqua veluti materia condensata Sol et stellae factae fuerunt.

‡ (Estius)—Videtur fuisse corpus lucidum. Fortasse nubes lucida quae motu circulari diem noctemque confecit, exqua condensata Sol formatus est.—*Poli Synopsis in Gen.* 1.

Other reconciling hypotheses may be found in the same place.

records; nor let any exposition of Genesis be viewed with unreasonable jealousy and prejudice, if they only propose probable or even possible modes of reconciliation, without pretending to absolute certainty, and especially if those expositions are not fundamentally different from such as are found in the writings of commentators who knew nothing of geology. Let us also learn from these facts, not to think it strange if the proposed modes of reconciliation are not any of them entirely free from difficulties, since these exist aside from geology in respect to the very same passages.

We shall now proceed to present the different modes that have been proposed for reconciling the facts of geology with those of revelation; and whenever these modes appear altogether inadequate to accomplish the object, and founded on false premises, we shall not hesitate to attempt to show their fallacy,—being satisfied that they tend to the injury of revelation in sceptical minds, by creating the impression that the cause is a bad one which depends upon palpably erroneous opinions.

1. *Some suppose that as the Scriptures were given for a moral purpose, and not to instruct us in chronology or physical science, we are not to regard the facts which they state concerning the latter subjects as inspired, but only as the private opinions of the writers, or the prevailing traditions and belief.* Hence they suppose that even real opposition may exist between geology and the Scripture, on its appropriate subjects, without at all impeaching the credibility of the latter.

This view of the subject so evidently aims a death-blow at the plenary inspiration of the Scriptures, that it would seem we need spend little time in its refutation. For if one man may pronounce the chronological and scientific facts given in the Bible to be uninspired, another man may select any other facts which seem to him opposed to philosophy and right reason, and reject them as uninspired; and so on, until nothing is left for the word of God which is opposed to human prejudice and corruption. True, it was not the object of the Bible to instruct us in philosophy; but moral truth, as stated in the Scriptures,

is connected with physical truth, and until the sacred writers inform us that they were inspired as to the one but not as to the other, we have no right to pronounce them infallible as to the one, but liable to error as to the other. These facts, however, ought to lead us to expect that subjects of science will not be treated in the Bible with philosophical accuracy, but that the language will be employed in its popular acceptation. It will be the language of the common people, and not of the learned. All therefore that we ought to expect is, that the Bible when fairly interpreted, shall not contradict the facts of science when rightly understood. In regard to a multitude of theories and hypotheses, whether philosophical, geological, or chronological, we ought not to look for the refutation or confirmation in the Bible, because it is silent upon the subjects; and philosophers, geologists, and chronologists, are at full liberty to speculate as they please on their favourite subjects, provided they do not interfere with the plainly revealed facts of the Bible. Their speculations, expressed in accurate scientific language, may even seem opposed to those of the Bible given in popular language; but when the facts of philosophy and those of the Bible, couched in the same language, are opposed, one or the other must be wrong. To resort in such a case to the theory which makes physical statements in the Bible uninspired, is, in fact, to abandon all belief in inspiration.

2. *Some regard the account of the creation in Genesis as a μῦθος, a fable invented by the author, or perhaps based on the traditions of the Hebrews.* Hence they look for no agreement between this fabulous history and the facts of geology. This hypothesis, advanced chiefly, we believe, by German rationalists, * is a still more gross denial of the inspiration of the Bible than the last. It will not be adopted of course by those who believe the Bible from beginning to end to be a revelation from God; and that is decidedly the ground which we assume.

* Some, as Bauer, Eichhorn, Hulda, and Ziegler, regard the Mosaic account as a *historical mythus*; others, as Paulus, Pott, &c. as a *philosophical mythus*.—*See Hahn's Theology.*

We will only therefore remark, in the words of Hensler, that "what is said of the creation in Genesis, is not of such a character as to lead us, with many recent writers, to take it all for a phantasmagoric representation: it may be a history of the creation. Commentators now understand every part of this relation so well, that one may say without hesitation that it may very properly be regarded as such a history. Even those to whom the whole appears as a painting, have yet separated different parts of the relation from each other so beautifully, that they have thereby destroyed their own hypothesis, and have only served to confirm their unprejudiced readers in the old opinion, that there is here a series of actual occurrences. It is true, indeed, that the writer relates these events in an animated style;—warmed by his sublime subject, he does not measure and weigh all his expressions with the same thoughtfulness that a natural philosopher would have done."*

3. *Some regard geology as mere speculation and hypothesis, and geologists as agreeing in nothing, unless it be in opposition to revelation.* Hence they think it unnecessary to vindicate the Bible against the objections of this science, at least until there shall be some tolerable agreement among its cultivators as to the principles of their science; for revelation rests its claims on evidence too firm to be affected by the airy breath of hypothesis. If such were a true statement of facts, it would indeed be a waste of time and of effort to combat mere visionary speculations and dreamy objections; and it would be easy to show, by quotations from their writings, that many pious and even learned men do entertain such views of geology and geologists. But it is a monstrous caricature. Whatever geology might have been some fifty years ago, it is no longer a bundle of crude specula-

† Bemerkungen über Stellen in den Psalmen und in der Genesis. S. 195. For the translation of this passage from Hensler, as well as for all the translations from the German in this paper, I am indebted to Mr. A. Kaufman, Jr. of the Theological Seminary, Andover. For a further refutation of the hypothesis in the text, see Stuart's Hebrew Chrestomathy.

tions and airy hypotheses, but a collection of most striking facts, with inferences legitimately drawn according to the strictest rules of the Baconian philosophy. We speak here of the fundamental principles of geology, which are based on a countless number of facts obtained in Europe and America,—among which there is such an agreement, that every logical mind is irresistibly led to adopt the inferences which flow from them; and concerning these there is no more disagreement among able geologists, than there is among astronomers about the fundamental principles of their science. Even in astronomy, there occasionally appears some Hutchinson or Phillips to write against Newton's Principia; as in geology, we meet with a Bugg, a Nolan, a Penn, or a Fairholme, who, with only a little book-knowledge on the subject, hesitate not to assail its fundamental principles. But the great mass of geologists coincide in their views of these principles, some of which they consider to be as well settled as those of astronomy; and they agree, too, on those very points which we have stated as coming into apparent collision with the common interpretation of Genesis. None, or scarcely none of them, doubt that the earth must have existed through vast periods of duration anterior to the creation of man. It is an inference forced upon them by the concurrent testimony of a thousand facts. Nor is it to be believed that these men have adopted such opinions because they have a secret bias against Christianity; for many—probably a majority—have ever given the most decided evidence that they are the friends and supporters of revealed truth, and that nothing but undeniable facts would lead them to adopt any opinions in science, which even apparently clash with revelation. Yet for such opinions they have been branded in the most violent manner as infidels and atheists.

We do not maintain that geologists are agreed as to every point in their science. For, on a variety of topics there is a great diversity of opinion; and those not conversant with the minutiæ of geology, and looking at these diversities from a distance, readily conclude every thing unsettled and in dispute; and knowing that some geo-

logists have been infidels and atheists, they naturally group them all into the same class. But the time has come when, on this subject as well as others, vituperation and abuse cannot pass for argument. The subject must be weighed in the balances, and truth will ultimately preponderate.

The subject under examination has been often and ably discussed, within the last few years, in the London Christian Observer—a work of deservedly high reputation. At the close of one of these discussions, a correspondent thus sums up the results to which it had led; and we quote them because we think every fair discussion will conduct to similar conclusions:—"First," says the writer, "The indubitable facts of geology are such as cannot be reconciled with the popular interpretation of the Mosaic narrative: Secondly, Infidel philosophers have made an evil use of this discrepancy as an argument against Divine revelation: Thirdly, Religious persons, fearful of prejudicing the sacred record, have unwarily strengthened the triumph of the infidel, by disputing against clear facts, just as the Papists did against Galileo's theorem of the motion of the earth,—instead of admitting them, and inquiring whether they could not be reconciled to Holy Writ, by a fair, even though it should be a new interpretation of the sacred records. Fourthly, That some Christian philosophers have felt it due to truth to admit the alleged geological facts, but have denied that they are contradictory to the statements of Divine revelation; and some of these, and other Christian philosophers, have proposed interpretations of the first chapter of Genesis, which they think both warrantable and satisfactory: Fifthly, That certain well-meaning Christian writers, shutting their eyes to the real difficulties of the case upon the popular interpretation, have accused the above Christian geologists of surrendering revelation to idle fancies, symbolizing with infidels, and setting up the speculations of man against the word of God: Sixthly, That it was due to truth to defend these calumniated persons, by carefully separating them from those sceptical philosophers, from whom, though they agreed in their

geological facts, they wholly differed upon the theological questions: Lastly, That it was not candid in the assailants to attack their Christian brethren as abettors of infidelity, while they themselves offered no solution of the difficulty, either by disproving the alleged geological facts and inferences, or by shewing how the Mosaic narrative coheres with them."*

4. *Some endeavour to escape from the geological difficulty, by maintaining that the fossiliferous rocks, with all the petrifactions which they contain, were created just as we find them, in a moment of time, and were not the result of a slow process of deposition and consolidation.* God, they say, might as easily have made matter to assume the form of a shell, a fish, a lizard, a fern, or a water-worn pebble, such as we find in these rocks, as any other shape and structure. He created animals and plants of their full size, and why may he not have formed the rocks in as perfect a state as we now find them? To persons not much acquainted with the details of geology, this statement and reasoning appear quite plausible; but to the geologist they appear absurd in the highest degree. It is not a new hypothesis. The Italian geologists devoted most of the sixteenth century to its discussion; and it was revived in England, France, and Germany, a century later. The point, however, was not exactly whether God created organic remains just as we find them, but whether they were ever real animals and plants. The great mass of writers maintained that they were produced either by a certain "plastic force" existing in the earth, or by the fermentation of a certain "materia pinguis" or "fatty matter," or by the influence of the heavenly bodies, or that they were mere "lusus naturae"—"sports of nature." Discussion, however, elicited truth, even in those dark ages of geology as well as of religion, and these ridiculous opinions were exploded. The "*Querulae* Piscium" of Scheuchzen, a work in

* Christian Observer, May 1834, p. 313. We recommend to those who take an interest in this subject, the perusal of the different articles concerning it in this work, for April, May, June, and August, 1834.

which the fossil fishes utter their complaints for being denied a real existence, were heard and regarded. That the question should be revived again under the light of the nineteenth century, is really an anomaly in the history of human opinion; but it has been of late advocated with great earnestness, both in this country and in Great Britain. We must therefore attempt to refute it.

The most effectual way to do this, would be to present before its advocates a series of organic remains; for we can hardly believe that any man who has carefully examined such a series, and especially who has seen them in their native beds, could ever really believe that they were created just as we find them, and never had a real existence. The grand objection to this opinion is, that it is opposed to all the known analogies of nature. We will illustrate this argument in several modes. A large proportion of the fossiliferous rocks are composed of sand and rounded and smoothed gravel, cemented together by iron or carbonate of lime. Now, let some of these pebbles be knocked out of their bed, and some of this sand crumbled down. Go now to the banks of a river, and collect some pebbles and sand from its beach, which you know have been worn down and deposited by the action of the stream. Place these by the side of the sand and pebbles obtained from the fossiliferous rocks, and you will see that they very exactly resemble each other. Can you now believe that the one group resulted from the sole agency of running water, while the other was never acted upon by water? You must believe this, if the hypothesis under consideration be true.

Those organic remains that occur in the solid rocks are usually converted into stone; but as we ascend to the unconsolidated strata, they consist for the most part only of the harder parts of the animal or plant that have resisted decomposition. Take now some of the undecayed relics, as, for example, a marine shell, or the skeleton of a hyena, a bear, or an elephant, and place them by the side of shells that are washed upon the beach by the waves, and of the skeletons of the same animals, or of allied species, recently killed. Are you prepared to

believe that the fossil group were created just as you find them, while the other group, hardly distinguishable in external or chemical character, were certainly once alive? Would not such a comparison convince every advocate of this hypothesis that he had assumed most untenable ground? But we may carry this illustration still further. For at least one rhinoceros and one elephant, most obviously of antediluvian origin, and therefore properly called fossil, have been found with their softer parts, their skin and flesh still undecayed; and these, too, if the fossiliferous rocks were created just as we find them, could never have been real animals, but only abortive resemblances.

To what absurdities will such a principle, if fairly followed out, lead us? A man in digging into the earth uncovers what seems to be a human skeleton, in a spot where he has no evidence that man was ever buried. His neighbour denies that this skeleton was ever clothed with flesh and animated with life. Could not God, he says, have created it just as we find it, as easily as to give matter any other form? Now this power of God must be admitted; and if a record of a burial of a man in that spot does not exist, how can it be proved to this man that his supposition is not true? It is just as difficult to prove this, as it is for the geologist to shew that organic remains were not created just as we now find them with the rocks in which they are imbedded.

"If two inhabitants from the banks of the newly-discovered Niger, who had never heard of Europe, were suddenly placed upon the cross of the cathedral of St. Paul in London, the one might ask the other how he could prove that this building, and the whole of London, were not thus created from the beginning—had not the Almighty power so to have created them? The other could only answer as the geologist does; and the one case is not a whit stronger than the other."* It need not seem strange that some of the earlier writers, who maintained that organic remains were never real plants

* Christian Observer, June 1834, p. 381.

and animals, carried out the principle to some of its legitimate results. Fallopius of Padua, for instance, professor though he was of anatomy, maintained that the tusks of elephants dug up in his time were mere earthy concretions, and that the vases found at Monte Testaceo in Rome were natural impressions stamped in the soil!* Is it not strange that the same principle has never led any one to maintain that the Egyptian mummies could never have been living men, but were perhaps generated by some plastic virtue residing in the earth, or were abortions of nature in her incipient efforts at creation, or that they are "the archetypes of men not yet called into existence;" or, finally, that for reasons unknown to us, they were created just as we find them!

How do we judge as to the mode in which any changes in nature, that come not under our immediate observation, have taken place? We can judge of this only from analogy,—that is, from similar changes that are occurring around us; and when no analogous change is going on, we are left to mere conjecture. Now, we do find that animals and plants, after death, pass sometimes into exactly the same condition as those in a fossil state. Some of them merely lose their softer parts,—others are partially changed into stone, by receiving mineral substances into their pores,—and others are completely changed into stone. But according to the principles we are combating, we may not hence infer that all organic remains were produced in a similar way; for the supposition is, that they were created just as we find them. Yet if we are not authorized to draw this inference in so plain a case, it seems to us that we can in no case infer any past change in the natural world from the evidence of present changes. We feel sure that no man at all acquainted with the rules of philosophical reasoning will for a moment consent to take this ground, and thus tear away at once the whole foundation of analogical reasoning.

We do not find organic remains promiscuously scattered through the rocks, but each formation has its peculiar

* Lyell's First Principles of Geology, Vol. I. p. 25.

group of animals and plants; and on comparing together the larger groups of strata, called classes or orders, we scarcely find any organic remains common to any two of them. In short, we find these fossil animals and plants arranged together in groups, very much as living animals and plants are,—different groups occupying different portions of the earth's surface and of the ocean. Analogy leads the mind irresistibly to the conclusion, that these remains were once living plants and animals, which, in different periods, occupied the ocean and dry land, grouped together as we now find them; and that as they died, they became enveloped in rock near the places where they had lived. But if they were created with the rocks just as we find them, this inference is false, and we have not only to account for their individual resemblance to existing animals and plants, but for this singular correspondence in what may be called their social condition.

But did not God create animals and vegetables of full size, and in their most perfect state? And may he not have done the same in respect to the rocks? "How can it be proved that all substances must have been formed in an incipient state merely? Were only *acorns* made at first instead of oaks? And was man an *infant* when first from the hands of his Creator?"*

Geologists do not contend that "all substances were formed in an incipient state;" but they contend that the fossiliferous rocks have been produced since the original creation, for the most part out of pre-existing rocks; because they appear to be composed of the abraded and comminuted fragments of other rocks, and because they see exactly the same process now going on before their eyes. Like effects they suppose result from like causes: at least, they must admit this principle until they have some evidence that its operation has been suspended by miraculous interference. And in the case of the fossiliferous rocks they have no such evidence.

As to the creation of vegetables, they are represented by Moses as produced by the earth, without seed. We

* Stuart's Hebrew Chrestomathy, p. 93, second edition, 1832.

have never seen any improvement upon Bishop Patrick's commentary on Gen. i. 12. "These things did not grow up out of seed by such a long process as is now required to bring them to maturity; but they sprung up in their perfection in the space of a day, with their seeds in them completely formed, to produce the like throughout all generations." Again, chap. ii. 5, he says—"That is, before there was any seed to produce them, God made them to spring up with their seed in them, or as was said before in the first chapter." If this interpretation be correct, we see, that even the formation of trees was a progressive work, though occupying less time perhaps than their germination and growth now do. But even allowing that, like man, they were created at once in full size and perfection, we think the case not analogous to the creation of fossiliferous rocks, with their organic remains, in a moment of time. For we see a design in the creation of man and of plants; but of what possible use could it be to create mere abortive resemblances to animals and plants, and to bury them in the rocks or soil, unendowed and never to be endowed with life? In every other part of creation, wise design is one of the most obvious features of nature; but here we see only a strange and anomalous waste of creative energy. It must then require strong evidence to prove a supposition so entirely at war with the whole course of nature.

But we will add no more on a subject which seems to us better fitted to the logomachy of the dark ages, than for the light of the nineteenth century. Respect for many wise and good men, to whom it has proved a stumbling-block, would not allow us to say less: though, if we could persuade such men to accompany us in the examination of a single fossiliferous deposite in the mountains, or even a suite of organic remains in the cabinet, we need probably have added no written argument. And we sincerely regret the necessity of a written argument; for the infidel geologist, who sees the absurdity of the position which we have combated, is led thereby to the conclusion that it must be a weak cause that resorts to such a mode of vindication.

5. *Some attempt to reconcile the geological and Mosaical records, by supposing that the earth occupied a longer time in its diurnal revolution at first than it does at present.*

This hypothesis is alluded to by Bishop Horsley, and enlarged upon and defended by Professor Jameson and Andrew Horn. Says the latter—"As the motions of our earth have been from the first dependent upon the sun, its influence upon the earth was at first extremely weak. Hence the diurnal rotation of the earth and progress in its orbit were then inconceivably slow; but the velocity of both motions gradually increased till the end of the fourth day, when the sun was perfected. The quantity of time, therefore, or duration of any one preceding minute or hour, was greater than any that succeeded; so that the first minute of the first day may have been equal, in duration or length of time, to a month or a year, compared with the last minute of the fourth day," &c.* This hypothesis appears to us entirely unsustained by facts. It is based upon the supposition that at first the earth was a hollow sphere of vast magnitude, which afterwards fell in—a mere gratuitous assumption. There is no evidence that the velocity of the earth's rotation has ever changed; and the fact that its present velocity would produce just that degree of oblateness which it possesses if it were fluid, renders it probable that it was not different in the beginning.

6. *It has been supposed that Adam may have lived in Paradise for an indefinite period previous to his fall, and that then geological changes were going forward.* This hypothesis is so directly at variance with the declaration in Genesis, that all the days that Adam lived were nine hundred and thirty years, that even its proposer subsequently abandoned it.†

7. *Some maintain that the language of Moses does not convey the idea that the matter of the universe was produced in the beginning out of nothing; but that it de-*

* Philosophical Magazine, Vol. XLVII. p. 243. See also p. 9, and Vol. XLVI. p. 227.

† Christian Observer, May 1834, p. 316.

scribes merely a renovation, or remodelling of the world out of pre-existing materials.

It is well known that the ancient Greek philosophers, as well as those in other heathen countries, reasoning as they thought irresistibly from the false position, *ex nihilo nihil fit*, believed it impossible even for God to create matter out of nothing; and hence they maintained that it existed coeternally with God,—neither of which principles was the cause of the other. Out of this matter they supposed God created, that is, renovated the universe. The same erroneous principle led many of the earlier Christian writers, especially the Platonists, to maintain the same position; and they thought it reconcilable with Scripture. The schoolmen, who followed Aristotle, taught that "*God had created the world from eternity*,"—thus reconciling their philosophy with the Scriptures by a metaphysical puzzle. Even in modern times, some Protestant theologians have maintained the possibility of the world's eternity. Among those, however, who advocate the opinion that the creation described in Genesis is altogether a renovation, we are not aware that any maintain the eternity of the world. Indeed, they mostly admit that other parts of Scripture do distinctly assert the production of the universe out of nothing, though the language of Moses does not teach this truth. The argument is stated in its full force by Professor Bush, whose language we quote.

"It is not from the language of any of the versions that we are taught to affix to בָּרָא the sense of absolute *creation out of nothing*. Is this idea then implied in the native import of the word as used in the Hebrew Scriptures? Unquestionably not, as the shewing of a host of eminent Hebraists has long since made evident. Its leading senses are two, which may thus be distinguished: 1. The production or effectuating of something new, rare, and wonderful—the bringing of something to pass in a striking and magnificent manner, Numb. xvi. 30; Jer. xxxi. 22. 2. The act or process of renovating, new-modelling, or organizing a substance already in exist-

ence, Psal. cii. 18; xxii. 31; li. 10; Isa. lxv. 17. In all these cases the act implied by the word is exerted upon a pre-existing substance. As, therefore, in every instance throughout the Scriptures of the use of this word as predicated of God, besides the one before us, it may be naturally interpreted in one or the other of the foregoing senses, we do not feel at liberty to make this case an exception, as prevailing usage is the only sure guide in determining the signification of words. That the prevailing usage of 'create' in the sacred writers is to *reform* or *renovate*, is unquestionable; and if this acceptation be departed from in the first verse of Genesis, we feel constrained to demand upon what authority it is done. It is not sufficient to say that in the nature of the case it *must* here mean to create out of nothing, since otherwise we are driven to admit that the world has existed from eternity—the rock upon which the old philosophers split. But this consequence is by no means conceded. No man can *prove* that the world has existed from eternity; and we have, moreover, positive inspired testimony that there *was* a time when the material fabric of the creation did not exist, Psal. xx. 2; Prov. viii. 26. But while we have these infallible declarations, assuring us that the matter of the heavens and the earth had a beginning, we know of no part of revelation which acquaints us with the *date of that beginning*, nor do we see any necessity, *a priori*, that we should be made acquainted with it, any more than that the precise period of its destruction, if it is to be destroyed, should be made known to us. Our conclusion therefore is, as both philosophy and theology are bound to bend to philology, that the materials, the primordial elements of the heavens and the earth, were in existence at the commencement of the six days' work; and that the word *create* expresses the action of the Almighty agent upon the rude chaotic mass, in moulding and arranging it into its present comely forms and beautiful order. In this view of the subject, the objections sometimes urged against the Mosaic history, on the ground of geological discoveries and declarations, are done away; for we may allow an indefinitely

long period for the production of physical phenomena, anterior to the commencement of the work here announced; and it is certainly desirable, as far as it can be done consistently with a fair and unforced interpretation, to harmonize the truths of Divine revelation with those of natural science."*

We acquiesce in the conclusion of this writer, that Moses does not fix *the date of the beginning* of the universe; but we should derive it from different premises. We doubt the soundness of that interpretation which maintains that Moses does not describe in the first verse of his history a creation from nothing. From the usus loquendi of בָּרָא, we might not be able to determine that it teaches a creation from nothing; for it is undeniably used to signify a creation from materials already in existence, even in the first chapter of Genesis, chap. i. 27; and it also signifies frequently in the Scriptures, in a metaphorical sense, *to renew, to found, to be the author of any thing*, Isa. xlviii. 7; Ps. li. 12. But the same indefiniteness of meaning attaches to the word signifying *to create*, in all languages. We must therefore resort to other means for ascertaining the sense of בָּרָא, in Gen. i. 1. And have we not evidence in various forms of expression, by which the different inspired writers describe the universe as created out of nothing, how they understood this declaration of Moses? They speak distinctly of a period when the universe did not exist, Ps. xc. 2. *Before the mountains were brought forth, or ever thou hadst formed the earth and the world;* and Prov. viii. 26. *While as yet he had not made the earth, nor the fields, nor the highest parts of the dust of the world,—"that is, the very first elements."* (Bush.) Creative power is represented throughout the Bible as a principal characteristic by which God is distinguished from idols, who possess not such a power, Isa. xlii. 5; Ps. cxv. 3; Jer. x. 10—16; Ps. cxlvi. 6; Isa. xlv. 9, seq.; Acts xvii. 24. Finally, the Scriptures represent the universe as created

* Questions and Notes on Genesis, New York, 1831.

out of nothing, Heb. xi. 3. *By faith we are certain that the world was created by the decree or will* (ῥήματι) *of God; so that what we see was made out of nothing.* (τὰ μὴ φαινομένα.) This expression appears to be equivalent to the passage in 2 Macc. vii. 28, where God is said to have made heaven and earth ἐξ οὐκ ὄντων. Upon the whole, it seems to us, that the exposition which so many of the sacred writers have given us of the work of creation, will not allow us to understand Gen. i. 1, in any other sense than a creation out of nothing.

The contrary opinion, however, has prevailed, and still prevails extensively, and among able writers. From the following extracts it would seem that, in Germany at least, it has been the most usual exegesis. "The first production of our earth," says Dathe, "is not described, but another, or its renovation." This opinion is rendered probable, partly from observations of modern philosophers, who discover in the interior of the earth many traces of some ancient and long-continued inundation, formerly identified with too little accuracy by many with the deluge of Noah, and partly from the words of Scripture—an argument I judge not to be despised."* "The present age," says Doederlin, "which has seen many cultivators of natural science distinguished for their sagacity and erudition, almost unanimously maintains the opinion, that a remarkable renovation (ἀναγέννησιν) and metamorphosis of our globe is described, which, because after its original creation, (in what manner and at what time brought about I know not,) it was desolated and lost its original form and ancient population,—being immersed in water and obscured by clouds, was remodelled in a new form, and animated with new inhabitants, that still

* Non describitur prima telluris nostrae productio, sed altera, sive ejus restauratio. Quod partim, per observationes physicorum recentiorum probabile fit, qui in interioribus terrae partibus multa vestigia deprehendunt vetustioris et diuturnioris cujusdam inundationis, quam Noachicae, cui insignes illae mutationes, quas terra nostra subiit, olim a multis, sed parvum accurate tribuebantur; partim ex verbis ipsius textus, argumento, uti arbitror non contemnendo.—*Penteteuchus a Dathio*, p. 8.

survive. And, first, this opinion derives some probability from Ps. civ. 6—9, which describes the first appearance of our world; and from 2 Pet. iii. 6, which declares this former world (*ὁ τότε κόσμος*) to have been destroyed by water."*

If this opinion be admitted, it does indeed meet all the geological difficulties in a satisfactory manner; and the number and character of the learned men who have advocated it should lead us to treat it with respect. Our objections to it are wholly exegetical. Yet it would certainly be more reasonable to adopt it, than to admit that geology and revelation are at irreconcilable variance. We think, however, that there is a mode of reconciliation more satisfactory.

8. *Some maintain that the fossiliferous rocks were deposited by the deluge of Noah.*

In former times this opinion was considered almost *articulis stantis vel cadentis Ecclesiae*, and a denial of it as a rejection of the Bible. The physico-theological school of geologists urged it for centuries with the most dogmatic assurance. Indeed, so much had been imputed to the last deluge, that reasonable men began to doubt whether there was any evidence of that event in nature; and, if we mistake not, we see even at this day some of the effects of this revulsion of opinion, whereby some geologists are led to look with unreasonable suspicion upon every natural evidence of the last deluge. The question, however, is settled beyond all reasonable doubt, that the effects of a deluge of one year's duration must have been confined almost entirely to the surface of the

* Atque nostra aetas, quae rerum naturalium indagata res, perspicacia ac eruditione claros, plurimos vidit, communem fere profitetur sententiam, describi *ἀναγίνησιν* ac metamorphosin orbis nostri insignem, qui cum post primam creationem, nescis, quo tempore, quove modo factam, diluvio quodam vastatus esset, amissetque priorem formam, veteresque incolas aquis immersus, obscurus nebulis, in novam formam restauraretur ac novis colonis, qui adhuc perdurant, reviviscent. Ac primum huic sententiae aliqua probabilitas accedere videtur ex Ps. civ. 6—9, qui primam orbis nostri faciam depingit, ac 2 Pet. iii. 6, qui priorem mundum (*ὁ τότε κόσμος*) aquis destructam testatur.—*Doederlinii Theologia*, p. 485.

globe, and that those effects must have consisted chiefly in the wearing away of rocks, and the piling up of coarse detritus. To suppose that strata thousands of feet in thickness, with their organic remains arranged in regular groups, and for the most part converted into stone, and their most delicate parts often unworn,—that even several distinct and separate races of plants and animals were fossilized by such a deluge,—that numerous changes should have taken place, sometimes slowly and sometimes suddenly, in the materials which its waters held in solution or suspension, so that sandstone, conglomerate, slate, and limestone, should be deposited,—that, in short, processes should have been finished in one year, which, from all we know of the operations of nature according to her present laws, must have demanded ages upon ages,—he who can believe all this, or any other impossibility, may consistently impute to the last deluge the production of the fossiliferous rocks. But the opinion has been abandoned by all practical geologists, although we suspect that it is still maintained with a good deal of vagueness by a large proportion of the community, and by some intelligent men. We hope, therefore, at some future time, to be able to enter more fully into the argument.

9. *Some suppose that the fossiliferous rocks were deposited during the* 1600 *years that intervened between the creation and the deluge, and that the non-fossiliferous rocks were produced in a moment by the power of God.* This opinion is maintained with a good deal of earnestness by a certain class of writers, who, whatever be their acquaintance with geological authors, are not practically familiar with the subject, and are therefore deficient in one of the important requisites for judging correctly concerning it. The most that can be admitted respecting this hypothesis is, that it may possibly be true, because it is possible geologists may be mistaken in their inferences; but it is by no means probable. The following are the most prominent of our objections:—

1. It does not allow time enough. That a deposition of rocks was going on in various places during these 1600 years, must be admitted. But the same process

has been advancing since the deluge; and although more than double that period, we see no evidence that strata have been produced a thousandth part of the thickness of the fossiliferous rocks. But can any reason be given why the process of deposition should have been more rapid before than since the deluge? If not, the fossiliferous rocks above diluvium should exceed in thickness those below it.*

2. It supposes that the sea and land must have changed places at the deluge, in order to bring the fossiliferous rocks into view. But the history of diluvium renders it extremely probable that a large part of Europe, Asia, and America, remain essentially as before that catastrophe.

3. The history of organic remains shews us that there have been several successive extinctions and removals of animal and vegetable life on our globe, since the fossiliferous rocks began to be deposited; and the earliest races were altogether different from those now inhabiting the globe. Can we believe that such astonishing changes took place in organic life between the creation of man and the deluge, and yet no allusion have been made to them in the sacred record? The animals described by Moses as created during the six days, appear to have been such as now inhabit the earth; but many of those found in the rocks were so different, that comparative anatomists declare they could not have been contemporaries with our present animals, because they must have required so very different a climate, temperature, food, &c. If they were contemporaries, why are not the remains of existing species found among those that are extinct?

4. During the deposition of the fossiliferous rocks, catastrophes must have occurred which would have swept the globe of inhabitants. While this process was going on, continents must have been several times elevated, and parts of them at least several times again submerged, sometimes beneath fresh and sometimes beneath salt water, in order that such alternations of salt and fresh

* See Ure's Geology—Penn's Comparative Estimate—Fairholme's Scriptural Geology—Comstock's Geology.

water strata, as we now find in the rock series, might have been produced. Now, there is no such thing as elevating from the ocean a continent, or single mountain ridge of much extent, without throwing a tremendous mass of waters over the whole globe. And the history of the fossiliferous rocks shews us that such catastrophes did probably take place during their deposition; and we have reason to suppose that in this way successive races of animals and plants were destroyed. How then could man and the existing species have survived? Is it not clear, from the sacred record, that no very remarkable change took place on the globe after the creation of man till the Noachian deluge? It has indeed been suggested,* that some severe convulsion did occur in the days of Peleg; *for in his days the earth was divided*, Gen. x. 25. But that this division relates to the confusion of tongues and the consequent dispersion of man, is a much more rational interpretation, than to suppose it to refer to a geological catastrophe.

5. Finally, there is scarcely less evidence that the primary rocks were produced by secondary causes, than that the fossiliferous strata were thus deposited. For in some of the stratified primary groups there are very distinct traces of a mechanical origin. In short, it is entirely probable that they are secondary rocks, modified by heat and other agencies, and therefore called appropriately *metamorphic* rocks; and it is not in the power of the most practised geologist to draw the line, in all cases, between secondary and primary rocks. As to the unstratified primary rocks also, very few geologists now doubt but they are the products of heat. If any principle is established in geology, it seems to us to be that which regards granite, sienite, porphyry, &c. as having been intruded among the stratified rocks while in a melted state, and therefore they were not created just as we find them. Further, these rocks have protruded through the fossiliferous strata as high at least as the chalk—showing that they have been produced subsequently to the fossiliferous rocks. And,

* Henderson's Travels in Iceland.

finally, what will the advocates of this theory say to the fact, that recently a mass of graywacke, containing petrifactions, has been found enveloped in granite?

10. *Another method of obviating the geological difficulty under consideration, is to regard the days of creation as periods of indefinite length, instead of* 24 *hours.*

Even from the earliest times we find Jewish and Christian writers maintaining that the word *day* in Genesis was not to be understood literally. Josephus and Philo affirm that the Mosaic account of the six days' work is metaphorical; and the latter says, "it is a piece of rustic simplicity to understand it literally."* It appears even to have been a prevalent opinion among the Jews, that each יוֹם occupied 1000 years,—hence that people reckon six millenaries before the advent of the Messiah.†

Origen attempts to shew the absurdity of regarding the Mosaic יוֹם as a literal day. "Cuinam quaeso sensum habenti convenienter videbitur dictum, quod dies prima, et secunda, et tertia, in quibus et vespera nominatur, et mane, fuerint sine sole, et sine luna, et sine stellis: prima autem dies sine coelo." "To what sensible man will it appear to be appropriately said, that there should be a first, second, and third day, in which both evening and morning are named, without the sun, or moon, or stars—the first, indeed, without any heavens!" ‡

St. Augustin also declares that the words *morning* and *evening* in Genesis, are not to be understood as the beginning and end of natural days; and he adds, "Qui dies, cujusmodi sint, aut prediffícile nobis, aut etiam impossibile est cogitare, quanto magis dicere." "It is very difficult, if not impossible for us to conceive, much less to explain, what sort of days these were." §

In the eighth century we find Bede, ‖ so deservedly styled the *venerable*, expressing a similar opinion in his annotation on Gen. i. 5, *and the evening and the morning were the first day.* "*Fortassis*," he remarks, "hic

* Philosophical Magazine, Vol. XLVII. p. 260.

† De Luc's Letters on the Physical History of the Earth, by Rev. H. de la Fitte, p. 110, London 1831.

‡ Ib. p. 100 § Ib. p. 100. ‖ Ib. p. 100.

diei nomen, totius temporis nomen est, et omnia volumina seculorum hoc vocabulo includit." "Perhaps the word *day* here means all time, and includes all the revolutions of ages."

So far as we can ascertain, Whiston appears to have been the first geologico-theological writer who distinctly advocated the opinion, that the Mosaic days of creation were to be understood as longer periods than 24 hours. He regarded them as each a year.* We find, however, that Duguet, a distinguished French commentator, who wrote more than a century ago, regarded the word *day* as signifying an indefinite time.† Des Cartes extended each day to 6000 years. Afterwards De Luc, Professor of Geology at Göttingen, in his "Lettres sur l'Education religieuse de l'Enfance," published in 1799, maintained, with no small ability, the necessity of understanding the word *day* as synonymous with an indefinite period. He contended that "the seventh Mosaic day must evidently be considered as a period of rest of indefinite duration, as a period which commences after the creation, and is not to terminate until after a great change in the order of things,"‡—that is, until the final destruction of the globe. This is the hypothesis which in our own day has been defended with ability by Faber in his "Treatise on the Patriarchal, Levitical, and Christian Dispensations." Townsend, also, in his "Vindication of Moses," says, that in perfect conformity to prophetic language, the term *day* may be referred to periods in general, without meaning to restrict the word to its present application.§ Michaelis adopted the opinion that the first four days are to be regarded as periods of indefinite length, and the remaining two each 24 hours.

The arguments in favour of interpreting the word יוֹם in Genesis, as a period of indefinite length, are the following:

1. This word is often used in Scripture to signify a period of indefinite length. Says Christ, *So also shall*

* Knapp's Theology, Vol. I. p. 364.
† De Luc's Letters, p. 101.
‡ Ib. p. 95.
§ Vol. I. p. 41.

the Son of Man be in his day—Your father Abraham rejoiced to see my day, Luke xvii. 24; John viii. 56. Says Job, chap. xiv. 6, *Till he shall accomplish as an hireling his day.* Says Ezekiel, chap. xxi. 25, *And thou profane wicked prince of Israel, whose day is come, &c.* The Psalmist also speaks of *the day of calamity*, and *the day of trouble.* All these cases, however, are synecdoches, and the figure cannot be mistaken by the most common observer. But in Gen. ii. 4, the case is much stronger and more to the point: *These are the generations of the heavens and of the earth when they were created, in the day that the Lord God made the earth and the heavens.* Had no other account but this been left us of the time employed in the work of creation, would not the natural inference be, that a single day of 24 hours was all that was occupied? And would not the proposal to give the word in this place the meaning which we now know to be the true one, have been regarded as forced and unnatural, quite as much as it now seems to affix the like meaning to the six days of the first chapter?

In the plural this word is still more indefinite in respect to the time which it designates. Very often, because time is made up of days, יָמִים signifies time in general; as in Gen. viii. 22, *while the earth remaineth*, הָאָרֶץ עוֹד כָּל־יְמֵי. Sometimes it denotes a whole year, Gen. iv. 3, where מִקֵּץ יָמִים (literally, *at the end of the days,*) *means a year.* See also Lev. lii. 29, where we have יָמִים שְׁנַתַּיִם *annus dierum.* In the same manner שְׁנַתַּיִם יָמִים מִקֵּץ (literally *anni dierum, years of days,*) signifies two whole years, Gen xli. 1. See also Jer. xxviii. 3, 11. On the same principles יָמִים חֹדֶשׁ (Gen. xxix. 14) signifies a month, and יֶרַח יָמִים (Deut. xxi. 13) denotes the same period.

The meaning of *day* in all languages corresponds almost exactly with its signification in the Hebrew; so that we can judge from the *usus loquendi* among us, whether the term in Genesis will admit of the interpre-

tation under consideration. In the plural, indeed, the word seems to have been applied among the Hebrews in a more anomalous manner than among more modern and civilized nations, whose better acquaintance with astronomy enables them to describe particular periods of time with greater accuracy. But this fact can have only a slight bearing upon the meaning of day in the first chapter of Genesis, because the plural is not there used. It merely shows that the word has a wide range of meaning; and therefore it affords a presumption in favour of the interpretation under examination.

2. The first three days of creation cannot have been ordinary days, because the sun, moon, and stars were not created till the fourth period; or, at any rate, they were not appointed till the fourth day, *to divide the day from the night*, or *between the day and the night*. Some different measure, then, must have been adopted by the sacred writer, by which the length of a day might be determined from that now employed. And if we once admit that one of those demiurgic days was either more or less than 24 hours, there is no objection to assigning to them a length as great as geology demands. Even if we admit that the sun and moon were created on the first day, yet the appointment they received on the fourth, *to be for signs and for seasons, and for days and years*, implies some remarkable change in the earth's relation to them; and we can hardly conceive of any important change of this sort which would not affect the length of day and night. Or, if we suppose that the sun and moon, as the language of our common translation implies, were not called into existence till the fourth day, and admit that previously the earth had a revolution on its axis, producing day and night by means of the light that was created on the first day, yet how improbable that the rotatory motion would be of the same duration before as after the creation of the sun? And if it can be shown or rendered probable, that the first three days were not precisely 24 hours long, we get rid of the grand exegetical objection to understanding all of the days as long and indefinite periods.

3. The seventh day has been a long period. God's resting on the seventh day consisted in a mere cessation from the work of creation. Now, unless there be evidence that he has resumed that work since that time,—and few will admit this,—his rest, that is, the seventh day, still continues; and we have no evidence that it will terminate till the period when he will create a new heaven and a new earth. The seventh day, therefore, extends from the creation of the world to its final destruction. Hence no reason can be urged why we should not allow a period equally long for each of the previous six days.

4. This interpretation is no more at variance with the plain literal meaning of scriptural language, than that which, in a variety of places, is universally admitted, in order to reconcile the Bible with the principles of astronomy. It ought not to be forgotten, that it is not much over 200 years since Galileo was compelled on his knees, before the Cardinal Inquisitors, to "abjure, curse, and detest" the opinion that the sun was immoveably fixed in the centre of the system, and that the earth was neither in the centre nor immoveable; because those opinions were then regarded as "false and absurd in philosophy," and "expressly contrary to Holy Scripture." When men in those days read in the Bible of the sun's rising and setting, and other apparent motions of the heavenly bodies, and they had not been taught by astronomy that their true motions were different, how could they avoid the conclusion that Galileo's opinion was "expressly contrary to Holy Scripture?" But who doubts now that the sacred writers speak according to apparent and optical, and not according to real or physical truth? If, then, the undeniable principles of geology demand that the term *day* in Genesis should be understood as indicating a long indefinite period, why should we refuse that to geology which has been granted to astronomy?

5. This theory of interpretation coincides in a remarkable manner with the cosmogonies of many heathen nations. In the Institutes of Menu, we find an account of the day and night of Brahma, in connection with the essence of his creative energy. "Learn now," says he,

" the duration of a day and night of Brahma, and of the several ages," &c.—" Sages have given the name of Crita to an age containing 4000 years of the gods: the twilight preceding it consists of as many hundreds, and the twilight following it of the same numbers," &c. And by reckoning a thousand such divine ages, a day of Brahma may be known: his night has also an equal duration. —" At the close of his night, having long reposed, he awakes, and awakening exerts intellect"—intellect called into action by his will to create worlds, performs again the work of creation." *

According to Suidas, the ancient Etruscans had a history of very early date, in which the work of creation was described as accomplished in six periods of 1000 years each. During the first chiliad or millennium, the heavens and earth were created,—during the second, the visible firmament,—during the third, the waters of the ocean and those contained in the earth,—during the fourth, the great luminaries of heaven,—during the fifth, the vegetables and all kinds of animals,—and during the sixth and last, man. A similar opinion prevailed among the Persians.

It is very clear that the Hindoo, Etruscan, and Mosaic cosmogonies, were derived from the same original source. There is too much common to them to permit the belief that each of them had an independent origin. How happens it, then, that the idea of long periods, instead of literal days, is so thoroughly incorporated into the two former? Can we avoid the presumption that the demiurgic periods were thus originally understood, and that they are thus to be interpreted in the Mosaic account?

6. Finally, this theory of interpretation developes a striking coincidence between the records of Moses and of geology. Baron Cuvier asserts, " that the cosmogony of Moses assigns to the epochs of creation precisely the same order as that which has been deduced from geological considerations;" and Professor Jameson has en-

* Philosophical Magazine, Vol. XLVII. p. 114.

deavoured to draw out this coincidence in detail. The two records agree in representing the present continents of our globe as having been for a long period submerged beneath the ocean, and that the globe for a long time did not contain any inhabitants. This happened during the first and second days. During the third, the mountains were elevated, and the cryptogamous plants first, and afterwards the dicotyledonous, are described by Moses as created; and their position in the fossiliferous strata is in correspondence with this statement. Passing by the fourth day, in which the sun, moon, and stars were created, or their present relative situation and offices fixed, the first creation of the fifth day was the inhabitants of the waters,—the second, flying things,—and the third, great reptiles (הַתַּנִּינִם τὰ κήτη τά μεγάλα, *great whales*, Sept.); and we find, accordingly, that fossil birds are found along with fishes and other marine animals, while a most remarkable tribe of enormous lizards appear to have lived at nearly the same period. In the first part of the sixth day the mammalia were created, and man last of all; and we find the remains of quadrupeds only in some of the highest of the tertiary beds, in diluvium, and alluvium, while man has been scarcely found even as low as diluvium—all in perfect correspondence with the sacred record.*

Now, if we suppose the six periods of creation to have been only ordinary days, it is not possible to see why the remains of those created on the sixth day should not be found mixed with those that were produced on the third, since there could have been a difference only of 72 hours in their ages. But if each of these days was a long period, we can conceive how vast numbers of those first created must have died and been enveloped in a stony bed before the others existed. How strong the presumption, then, that long periods must have been intended by the demiurgic day of Moses.

Not many distinguished commentators on the Bible

* Bakewell's Geology, p. 450, New Haven, 1833. Second American Edition.

have undertaken formally to defend the interpretation of the Mosaic days which we have been illustrating. We have, however, mentioned several well known authors, whose views essentially coincide with it. But several of these could lay no strong claim to an extensive acquaintance with philology. De Luc, for instance, ignorant of the Hebrew, resorted to Professor Michaelis, who "assured him that he was entirely authorized to adopt that interpretation, which the professor even strengthened by new arguments."*

Among other German writers of note who have advanced opinions favourable to this interpretation, may be mentioned Hahn. In his theology, he thus expresses himself:—"Our mind can neither comprehend nor approve the thought that the universe in its perfect state was produced at once from nothing. Hence the statement of the Holy Bible corresponds as well to the laws of thought, as to the nature of finite things generally. For it relates, that first the *material* of the whole (Gen. i. 1.) was made, and then from it was produced one thing after another, as well pleasing to the Divine Architect (ver. 2); and thus the world first received its completion in *six divisions of time*, which the Scriptures *symbolically* denominate *days*."†

The notoriously sceptical writer, Bretschneider, thus summarily disposes of the geological difficulties:—"Whether by the days of creation are to be understood literal days—that is, the times of the earth's revolution upon its own axis, or whether large periods, (as יום frequently indicates in the prophets,) or whether these should be considered as merely the arbitrary costume by which Moses wished to make comprehensible the series of creations, may be left undecided. The objection, however, that the earth must be much more than 6000 years old, as the reckoning in Genesis would intimate, does not concern the history of creation, but the Mosaic chronology. *But inasmuch as this does not belong to religion,*

* De Luc's Letters, by De la Fitte, p. 88.
† Christl. Glaub. S. 266.

it may be fallible, as it is indeed. In regard to the time when the different formations were produced, we know nothing; and they may have been 100,000 years in progress. As little do we know how long the condition of the earth, described in Gen. i. 2, and the condition of the other planets may have continued, nor with what changes it may have been accompanied. On account of this last circumstance, it will always remain difficult and superfluous to attempt to explain, on physical principles, the formations described by Moses."*

We have met with no writer who has gone into a more laboured defence of this interpretation, on philological as well as philosophical principles, than Hensler. His loose and sceptical views as to the Mosaic history, which form the basis of his whole argument, ought to be first described; and we shall let him do it in his own language.

"He who maintains that the *essential* of the relation, the knowledge of the facts themselves, and the order in which they followed each other, is a Divine revelation, must not therefore derive the *non-essential* also from God. The non-essential was left to the choice and selection of the *old writer* (Moses.) From him originated not only the expressions, but also the *division* of the work into *periods*. This division served to render the matter palpable to the senses, and presented it in such a form that it could easily be remembered. It is difficult to say why the precise number six was chosen. The choice of this number may have been entirely accidental, so that the writer might as well have chosen a smaller or a greater number. Had he selected a smaller number of periods, say four, he would then have been compelled to crowd more events into each one. There may, however, have been a distinct design why this number was chosen. Most recent writers assume this; yet they do not use it to explain the essence of the relations before us, as being an invention of the writer. The events may indeed have been divided by him arbitrarily into six portions; and

* Dogmatik, Bt. 539—542.

yet the events themselves may have followed one another in the order designated. In the one case he may have been an inventor, and in the other a mere narrator."

To one who takes such a view as this of the Mosaic history, it must seem a matter of no small importance whether that history be reconcilable with geology or not. But those who believe in the inspiration of every part of the Bible, may like to see by what reasoning Hensler sustains his interpretation of the Mosaic days. We can give only a few samples of it:—

"In six periods of time (not *days* observe), the creation was completed. The earth was at a certain time empty and void,—it was nothing but rough matter unarranged and in dead peace: Then darkness was upon the deep—the earth was universally covered with water, upon which deep darkness still rested. Then the power of God moved upon the face of the waters; (from the original energy proceeded a power which was gradually to arrange, form, and animate all things;) 'and God said, Let there be light, and there was light.' Now there was a distinction between light and darkness—the former was day, the latter night. Here ends the first stadium of the great course—God now caused a firmament to be made, by means of which the waters under it, which covered the earth far and wide, were separated from the waters above the firmament. Hitherto, in the universal darkness, the twofold waters were not distinguishable—all was *one* flood of waters: Now, as it became more light, the separation of the two waters from each other was first seen. A firmament—the Heaven—which vaulted itself over the earth as a hemisphere, made the separation. The upper waters which contained the exhaustless treasures of rain, lay, according to the optical appearance, upon this vault, and rested upon it. The waters of the earth are deep under the vault. These are the things which the second period brought with it. Now a change which concerns the earth alone. The water which had hitherto covered the earth far around, accumulates in certain places, and collects itself together, so as to produce the sea and the firm land. So when the land is free from the water, a

multitude of things grow up. This was the third series of events," &c.

"It is worthy of the Godhead to suppose that the formation of the earth here described, and of the animals that inhabited it, were produced by the same process, which, being communicated to the earth from the original Power, now operate continually; that they were produced according to similar laws as those which still uphold and continue them. And this assumption is not contradicted by antiquity, or the oldest records (the Bible). It is true, indeed, that in certain places, they speak of God, as if he had produced them by his immediate power; but this is nothing more than the use of language in those times, when they were accustomed to refer all things immediately to God. But more than this: the writer evidently indicates, that he does not intend to deny to natural powers their part in the new formation and regulation of the earth. It is several times said, God willed that something should be so, and it was so: several times it is said that God found what was made good; that is, it was so made as God wished to have it. A writer could not have used this form of expression, if he had thought of every advance of the work of creation, as flowing immediately from the Divine Omnipotence."

"Gen. i. 5, 8, 13, 19, 23, 31; ii. 2. The writer could not have believed, that the creation, beginning in the evening, was brought to perfection after 144 hours: He cannot speak of a creation perfected in six days. He certainly designs to ascribe to the great series of events a longer continuance. He describes all as advancing gradually; he represents, as has already been remarked, the powers of nature as regularly developing their activity; (and this developement does not gradually take place by springs or leaps.) But he who does this, certainly cannot design to say, that all this great and wonderful creation was brought to a perfect state in six times 24 hours. He, as every one of us now does, adopted periods of an indefinite length."

"The only question now before us is, does he speak

definitely and expressly of such periods, or does he merely pre-suppose them in his revelation?"

"Many learned men have adopted the first view; and have translated יוֹם, v. 5, 8, 13, &c. directly, *period*. This view has much in its favour. It is very certain that יוֹם may signify *time, period*. The Hebrews, even in the later books, when the language was much more cultivated, had no other word to express period: (for עֵדָה expresses an entirely different idea.) Isa. lxiii. 4, and a hundred other places furnish the proof of this. According to the usage of the language, therefore, יוֹם may here signify a period of indefinite length."

"May not the following conjecture correctly represent his aim? (Moses' aim.)"

"By the first and second יוֹם &c. if this does in all cases mean 24 hours, he understood the *chief day* of each one of the divisions of creation: (so that he, therefore, assumed real periods.) In each one of the six divisions, he names not only the determination of God that a work should be effected, and the progress of this work, but also the perfecting of the same; for which purpose he uses the formula, *and it was so*, וַיְהִי־כֵן; and he saw that it was good, וַיַּרְא כִּי־טוֹב. The day which solemnizes the perfecting this work, is with him, and rightly too, the chief day of the whole period. From the infinite number of days, of which each one of the six periods may have consisted, he notices this one only, the closing day. With the notice of the perfecting of each division, the naming of the last day may always be placed in connection. In v. 4, 5, for example, the language may very properly be thus understood: when God saw that the light which he had separated from the darkness was good: i. e. acting according to his design and in a finished state, (he named the light day and the darkness night) the evening and the morning were the first day: (that is, the last day in the sense of the first division.) So also v. 7, 8. Thus was it with the firmament, which God called heaven: now, the evening and the morning were the second

day. So likewise v. 21, 22, it is related of a part of the beasts, that as they were all created, God found this part good, and also communicated to them the power of propagating themselves: then the fifth day appeared. As to the 3d, 4th, and 5th days, this is still more evident."

"After the sixth chief day, the day which closed the last period, followed immediately a seventh for the commencing day of the period now following," &c.

It will be perceived that Hensler, in the latter part of the preceding remarks, has advanced an interpretation of the Mosaic days so different from all others, that it might properly be set down as a distinct method of reconciling geology with revelation. But, as it is in fact merely another mode of proving the periods of creation to have been of indefinite length, we thought it might be conveniently noticed under this head. We have met with no other philologist who has given such a meaning to יוֹם, except Granville Penn. This writer, in attempting to prove that the demiurgic periods are common days, undertakes to show that יוֹם in Gen. ii. 4, means the seventh natural day from the commencement of creation, or the first day of God's cessation from the work of creation, and not the whole of the six demiurgic days, as urged by Faber and other writers.* Had Mr. Penn thought of the use which Hensler has made of this method of interpretation, he would probably have been very slow to adopt it.

But it is not merely semi-infidel German commentators who have defended the extension of the Mosaic days into indefinite periods of duration. In giving the history of this interpretation, we have already mentioned several names that will have more weight with Christians than those of the ablest German Neologists; and we will here add a few more. We give first the opinion of Rev. Samuel Lee, the present distinguished Professor of Hebrew in the University of Cambridge, England.

"Such a sense," (an indefinite and metaphorical sense of יוֹם) says he, "is fairly to be collected from Numb.

* Comparative Estimate, Vol. I. p. 293. Second Edition, London, 1825.

xxviii. 26,—*the day of first fruits.* We have in Buxtorf's great Lexicon יוֹם יְמֵי *dies: latè sumptum est Tempus, et Synecdochicè Annus.*" This the examples will bear out. The compilers of the *Seven Seas** state that "*Roz*† is used in the sense of *Rozgar (time)* which is an appellation intimating opportunity (i. e. καιρὸς,) as they say, this is the time (season &c.) of such an one. In this case, therefore, it is indefinite. It is added, that the word is used in the sense of יוֹם, which is expressed also by *nihar* in Arabic."‡

Professor Wait, of the same University, has also given a full and able vindication of this sense of the Mosaic days. But we have room only to quote a few passages.

"I have now," says he "arrived at the main question. If in other instances יוֹם has this figurative sense, and if geology and philosophy in general oppose the idea, that the process of the creation was completed in six natural days, are we, when observing the fuller sense of the word in passages not to be disputed, authorized in confirming the six יְמֵי of the cosmogony to six natural days?"

"Now, as Glausius and others have shown, that where human properties and periods of time are predicated of the Divine Being, the language is necessarily anthropopathetical; connecting the Jewish opinion cited by Schoettgen, (that each יוֹם occupied 1000 years,) with St. Peter's assertion in Epist. 2. Chap. iii. 8, we may without violence suppose, that יוֹם was simply a term expressive of each period of the creation, without actually defining the period of its continuance." "If so, the six יְמֵי were indefinite epochs. In corroboration of this, the first chapter of Genesis details the six יְמֵי, during which the process advanced to its perfection, but in the second, at verse 4, we read of the creation of the heavens and of the earth, in the day, or at the period (בְּיוֹם) when the Lord

* *Haft Kulzum*, a valuable Persian Lexicon.

† The Persian of יוֹם or day. ‡ De Luc's Letters, p. 103.

God made them: therefore these six יָמִים must be comprised in the individual יוֹם, and the term must imply an indefinite period." * "When we consider the stupendous work of the creation, it is consentaneous to sound criticism to presume, that if instances occur, in which יוֹם is invested with a wider signification than that of the ordinary day, in which it expresses periods of time not defined by the passage, it must, *a fortiori*, have possessed this more ample and enlarged sense in the first chapter of Genesis." "From which collective reasons I have no hesitation in believing, that יוֹם in the first chapter of Genesis referred to a period consisting of a length not to be determined." †

This interpretation was also defended with much acuteness a few years ago by J. C. Prichard, Esq., well known as an able philologist and naturalist. ‡ Professor Jameson likewise has maintained this ground with no small ability, § and in our own country it has been ably defended by Professor Silliman. ‖

But notwithstanding these strong arguments and weighty authorities, we find ourselves compelled to look upon this interpretation of the Mosaic days as untenable, and for the following reasons. Some of these reasons are of so decided a character, that we cannot resist their power.

1. The terms (עֶרֶב, and בֹּקֶר) evening and morning, which begin and end, or rather constitute the Mosaic days, render it extremely probable that the writer intended merely ordinary days. The phrase וַיְהִי־בֹקֶר יוֹם verse 5, 8, 13, 19, 23, and 31, means literally, וַיְהִי־עֶרֶב *and there was evening and there was morning, a day.* Now, in the words of Professor Stuart, we may inquire,

* De Luc's Letters, p. 109.

† De Luc's Letters, p. 111.

‡ Philosophical Magazine, Vol. 46. p. 285. Vol 47. p. 110, 258 and 431. Vol. 48. p. 111.

§ Edinburgh New Philosophical Journal, 1832.

‖ Bakewell's Geology, 2d American Edition, p. 439.

"is an evening and a morning a period of some thousands of years? Is it in any sense, when so employed, an indefinite period? The answer is so plain and certain, that I need not repeat it." * It is clear, that in his case, the writer describes a day according to the Hebrew mode of computation, that is from sunset to sunset—a νυχθημέρον and in what more definite way could he describe a literal day?

The fifth verse seems still further to confirm the literal interpretation of יוֹם. In the first part of it, it is said that *God called the light day, and the darkness night.* Can there be any doubt but this is a literal day and a literal night? The extreme simplicity of the narration seems to render the idea of a synecdochial use of the words absurd. But in the same fifth verse, the word יוֹם is used to designate one of the six periods of the creation. What law of interpretation will justify us in supposing the sense to be thus suddenly changed, with no intimation on the part of the writer, and without any necessity in the text?

Hensler attempts to escape from this difficulty by resorting to his peculiar mode of interpretation already explained. That theory, we apprehend, will meet with but little favour among intelligent philologists; and therefore, we shall merely give his argument, without stopping formally to refute it.

"Here now," (says he respecting the last part of verse 5,) "the first יוֹם, which arose from עֶרֶב and בֹּקֶר, is the immediate and direct object of discourse. But here it may still be asked, whether this יוֹם can be so distinguished from the יוֹם immediately preceding, (which first יוֹם marks an ordinary day, the time as long as it is light,) as that a period of indefinite length may thereby be designated; or whether, on account of the context, on account of this collection of sentences, the last יוֹם must also signify a day: a common civil day of 24 hours; which, in all languages, ancient and modern, is indicated

* Comstock's Geology, p. 208. Hartford, 1834.

by the same word as the natural day? If we deem this last supposition to be necessary, we must believe that the writer, at the end of v. 5, speaks of an ordinary civil day, consisting of an evening and morning, (the natural day and night;) that in v. 8, he speaks of the second day of that kind; in v. 13, of the third, &c. But still there would not necessarily follow from this what is commonly inferred from it, namely, that the author by one such day wishes to designate the *whole time* within the limits of which one department of the creation was finished: that he, therefore, considered the use of light from the beginning to the end, as containing but 24 hours, and believed that the atmosphere was formed in the same number of hours." *

In a similar manner Hensler disposes of the whole objection under consideration, against considering the Mosaic days as indefinite periods. He begins by stating the argument in favour of regarding them as common days.

"The language of the record itself," says he, "compels us to understand יוֹם as a *day*, because the limits of this יוֹם are determined by morning and evening, in the use of which language it is impossible that any thing else than an ordinary day should be meant. This argument would be irrefragable;—we should be compelled to understand יוֹם as an ordinary civil day, if the language throughout could be used but of *one* evening and *one* morning. But what hinders us from taking both words collectively, as well as עֵרֶב in the 11th and 12th verses? Thus, *there were evenings, there were mornings;* or rather, (as the Arabic in the Polyglott has already done, and others have done, using it in the singular also,) *there were nights, there were days.* It is not improbable that this is the sense for בֹּקֶר, *morning*,—the beginning of the day is placed for the *whole* day; especially is this the case in poetry, as Isa. xxviii. 19; xxxiii. 2; l. 4. The same synecdoche may have been used in regard to עֶרֶב, *evening*. And here, indeed, we may well believe this synec-

* Bemerkungen über stellen in den Psalmen und in der Genesin.

dochial signification to be the correct one, inasmuch as the language of the narration has a poetic colouring."*

Professor Wait attempts to evade the force of our argument in another mode.

"It is obvious to reason," says he, "that if a *period*, whatever be its length, be metaphorically called *a day*, the analogy of metaphorical diction well required the beginning and close of such a period to be expressed in terms bearing a self-evident relation to that by which the period itself is designated; or, in other words, that as the morning and evening are component parts of *the day*, when the term *day* itself is figuratively applied, it will require these to express the opposite facts of that, of which יוֹם is the metaphor. On this principle, we read of the evening and the morning of the cosmogonical יוֹם: on this principle, in some passages, which compare human life to *a day*, we read of its morning, its noon, and its evening, and occasionally observe its close appropriately designated by the night: hence, also, the final judgment being called the great *day* of the Lord,—we read of the morning of the resurrection."†

This reasoning would certainly be quite plausible, if we only admit that Moses' description of the creation is metaphorical,—that is, if we admit his account to be poetry instead of history. To prove that this is the case, appeal has been made to the fourth day. Already had the author represented the repeated succession of day and night; but here he describes the sun, moon, and stars as first created and appointed to measure days, seasons, and years,—that is, he describes the standard as applied before that standard existed; and although this might be pardoned in a poet, it is unpardonable in a historian. To waive, however, all other modes of getting over this difficulty, it is sufficient to say, that most commentators at this day regard the heavenly bodies as having been created at least as early as the earth, and that they only received their appointments on the fourth day. This interpretation we shall examine in another place; but, ad-

* Bemerkungen, &c. † De Luc's Letters, p. 107.

mitting its correctness, it vindicates the character of Moses as a consistent historian, and it seems to us takes away the only semblance of an argument in favour of the poetic character of the Mosaic history. Indeed, it appears to be one of the plainest pieces of history in any language, adapted to the understandings of men scarcely at all cultivated. True, its exegesis is not free from difficulty; but we apprehend that those difficulties result from its great brevity and extreme simplicity, rather than from any occult and marvellous truths contained under figurative language. The man who comes to that history with his head full of philological rules and geological difficulties is disappointed and perplexed, because he expects to find too much in it; but the unlettered man finds most clearly exhibited there the great truth that God created the universe, and brought it into its present state, not in a moment of time, but gradually, as a human workman accomplishes an undertaking; and with these truths he is satisfied. Probably no such man ever thought that there was any thing figurative in that history; and this fact, we think, is a strong reason why the commentator should regard it as a literal history, unless imperiously required by the facts of science to regard it as figurative. Such necessity, we cannot believe, yet exists.

Now the whole argument in favour of regarding the Mosaic days as extended periods, rests upon the assumption that the language is metaphorical; and nearly every passage from other parts of Scripture brought to sustain this interpretation is most evidently figurative,—as *the day of the Lord, the day of prosperity, &c.* The only exception to this remark is perhaps Gen. ii. 4, which passage does certainly favour the interpretation of indefinite demiurgic periods, though by no means sufficient in our opinion to establish it. In order to do this, it must be shown, we think, that the history of the creation is figurative or poetical; and if this can be done, we know of no portion of history in the Bible, however simple and plain, that may not be regarded as figurative.

2. The word *day* is used several times in the Mosaic writings, where reference is made to the works of crea-

tion, in such a connection that we are compelled to understand it as meaning only a common day. We have already referred to an instance of this kind in Gen. i. 5, where יום in one part of the verse means most evidently a common day, while in the other part of the verse it denotes one of the demiurgic periods. Nor is there any thing in the language or connection that gives the least intimation of any change of meaning; and therefore sound criticism compels us to regard its meaning in both cases as identical. Another passage occurs in Exodus xx. 9, 10, 11. *Six days shall thou labour and do all thy work: But the seventh day is the Sabbath of the Lord thy God: in it thou shalt not do any work, &c. For in six days the Lord made heaven and earth, the sea and all that in them is, and rested the seventh day: wherefore the Lord blessed the Sabbath day and hallowed it.* (See a parallel passage, Ex. xxxi. 17.) It is impossible to doubt that in this passage the first six days spoken of, as well as the seventh or Sabbath day, are literal days: nor can there be any more doubt as to the Sabbath day in verse 11. What possible ground is there, unless we seek for it in the records of geology,—we mean what ground in the passage itself, for even suspecting that a different meaning should be attached to the other six days of creation, and the seventh day of rest in the passage? Nay, a different meaning cannot be attached to the latter, except in defiance of all the rules of interpretation; for there is not merely no evidence in favour of a change in the meaning, but positive and decisive evidence against it, so far as philology is concerned.

Some regard it a strong evidence that the Mosaic days were not indefinite periods, because such an interpretation seems to them, in the passage under consideration, to nullify the reason assigned for the sanctification of the Sabbath. We have never, however, felt deeply the force of this objection; and we have regarded Mr. Faber's reply to it as tolerably satisfactory. He regards "our minor week as a commemorative epitome of the great week," in which God created the universe; and he maintains that this prolonged rest of Jehovah from his mighty

work, may be urged as a reason for man to observe each seventh natural day for a Sabbath, with as much force as if the rest of the Deity had been only 24 hours. But, admitting all this, our difficulty is not removed. It seems to us to be inadmissible to suppose that, in the passage of the moral law which we have quoted, there should be found such a jumbling together of literal and figurative meaning as there must be, if *day* means one thing at the beginning and end of the fourth commandment, and a different thing in the middle. If, indeed, the first chapter of Genesis expressly told us that *day* means an indefinite period, it might be consonant to the rules of criticism to explain the brief description in the moral law by the more extended account in Genesis; but the fact is, that even in Genesis, no one would be led from the account itself to attach any other than a literal meaning to the word. And therefore it would be doing violence to every principle of sound criticism to introduce such an enigma into so plain and unimpassioned a piece of composition as the moral law. For even if any one can persuade himself that the Mosaic account of the creation is poetry and not history, we apprehend that no one will have the hardihood to maintain that there is any thing in the moral law but plain literal prose.

If, in so plain a passage, *day* is not to be taken in a literal sense, how is it possible to determine but that it means an indefinite period in other cases equally plain? When Moses, for instance, describes the waters of the deluge as prevailing 150 days, what should hinder us from regarding the actual time as so many thousands or even millions of years?

3. It appears from Gen. ii. 5, that it had not rained on the earth till after the creation of vegetables,—that is, till the third day. If day means an indefinite period, at least 6000 years according to Mr. Faber, then the earth existed more than 12,000 years without rain, and with a tropical climate too, as the records of geology testify. The great improbability of such a state of things, teaches us that literal days must have constituted the demiurgic period.

4. Such a meaning of the word *day* is forced and unnatural. It is so contrary to the natural import of the passages, that we doubt whether it would ever have occurred to a commentator who had never learnt the geological difficulty,—much less would an unlettered man have thought of it. Some of the ancient fathers, indeed, as we have seen, were led to suspect that the demiurgic periods could not have been natural days; and we apprehend that every intelligent man will be led, by a perusal of the Mosaic account, to doubt what might have been the precise nature of those periods. But this is quite a different thing from maintaining, as this theory of interpretation does, that Moses intended his readers should understand him to mean indefinite periods instead of literal days; for we may suppose the nature of those periods to be such, that although not really literal days, to describe them as such may give a more correct representation of the work of creation, than any other language that could be employed. The poverty of language, or more probably the entire dissimilarity between the present and the early state of the globe, may render it impossible to come nearer to the truth in describing the demiurgic periods than to call them days, although perhaps something quite different in reality. But to maintain such an hypothesis is quite a different thing from the position that Moses did not mean literal days, but indefinite periods. Had he intended these, how very easily might he have expressed it so that no one could have mistaken him; and how strange that no one for thousands of years ever suspected him of such a meaning, until certain geological difficulties had been thrown in as an objection to the plain and obvious sense of the passage! Had Moses been an obscure and enigmatical writer, whose style was formed on the models of a refined and subtle age, this interpretation might be more plausible. But to attempt to eke out such a sense from one of the simplest descriptions in any language, written expressly for a people scarcely advanced beyond a state of barbarism, is scarcely less absurd than for the physico-theological school of writers in the last century to tor-

ture that same language till it should teach all the principles of natural philosophy.

It has been, we think, a most common mistake among learned men to treat the sacred writings as if every sentence and every word must contain some profound truth, which learning alone could discover. And in attempting to go down in the diving-bell of criticism after the deep meaning, they have often got lost amid the muddy waters at the bottom; while the unlettered man has seen the plain meaning reflected beautifully, and without distortion, from the clear surface. We have in mind at this moment, as a good illustration of this statement, the recent attempt of Professor Jameson,* to prove that Moses, in his account of the creation of vegetables, has followed the best modern systems of botany, by dividing plants into phenogamian and cryptogamian; and that he does not mean *great whales* in Gen. i. 21, but great reptiles,—that is, we suppose, the Ichthyosaurus, the Pleisiosaurus, the Iguanodon, &c. agreeably to recent geological discoveries of the last edition of Cuvier's Ossemens Fossiles! We do not say that his criticisms are wanting in ingenuity; but we do regard it as supremely ridiculous, to endeavour to put upon Moses the strait jacket of modern naturalists, and to represent him as employing the accurate and precise language of science, when he so obviously uses words in a loose and popular sense.

5. Such are the philological difficulties in the way of understanding the Mosaic days as long periods. But we have also an objection to such an interpretation on geological grounds: and had we ever seen it noticed by any writer, we should feel confident that it is more difficult to be surmounted than the exegetical difficulty. Universally, we believe, those who adopt this interpretation, suppose that every species of animals and plants on the globe, fossil as well as living, was created during the six demiurgic periods. Consequently, all those 100,000 species of plants, cryptogamian as well as phenogamian now growing on the globe, must have been created during the

* Am. Journal of Science. Also Bakewell's Geology, p. 444.

third period: for Moses does not describe any creation of vegetables after the third day. All those species of animals that now live in the waters; the zoophyta, testacea, the crustacea, and the fishes, and the sea monsters, as well as flying birds and insects, must have been created on the fifth day, for the same reason: and in like manner, on the sixth day the land animals. But it is a well established fact, that of more than 3000 species of plants and animals that are found fossil in the secondary rocks, *not a single species* corresponds with any now living on the globe: and even out of the 3000 fossil species in the tertiary formation, less than 600 are identical with living species; and most of those that are identical, occur in the uppermost members even of the tertiary strata. Now, if existing species were created at the same time with the extinct ones, can any reason be given why their remains are not found mixed together? Even if we could show how a few species might be absent in the rocks, although now alive on the earth, yet it seems clear to us that the total dissimilarity between living and fossil species is entirely inexplicable on the supposition that they were contemporary inhabitants of the globe. We know that our present species are continually dying, and that their harder parts are as easily preserved as those of the extinct species: and the conclusion is irresistible, that they did not exist at the same time on the earth: otherwise their remains must have been found in rocks.

Do the advocates of this mode of interpretation admit this? Then they admit that more creations of animals and plants have taken place than Moses describes: for he describes but a single creation for each class. It follows of course that those which he does describe are *only such* as are now found fossil: that is to say, he speaks not at all about the creation of our present races of organized beings, but only of those entombed in the rocks, whose existence was not known till modern times. We do not believe that any man will attempt to maintain this alternative.

It is possible, however, that some who feel the pressure of this reasoning, rather than abandon their favourite exe-

gesis of the Mosaic days, will take the ground that the fossil species are not embraced in the creation described in Genesis, but only existing species. But if so, where is the need of regarding the demiurgic days as extended periods; for it is the history of organic remains, and that ONLY, which has led any to adopt this interpretation. If they exclude organic remains, then, from the Mosaic creation, they do not at all relieve the geological difficulty. They must not only defend an exegesis, which, at the best, is not admissible on philological principles, except in an extreme case, but they must still seek some other mode of relieving the geological difficulty.

In stating the arguments in favour of the mode of interpretation under consideration, we have seen that its advocates place great reliance upon the supposed coincidence between the order in which Moses describes the successive classes of plants and animals to have been created, and that which geology developes; and Professor Jameson has contrived to draw out a table of these coincidences in such a manner as to make the argument appear quite plausible. But its fallacy is demonstrated by the principles which we are examining. For in the first place, it appears clear, that if Moses' account of the creation of organized beings embraces the fossil species, then the present races of animals and plants were not included: an opinion too absurd to be admitted by any reasonable man. But if he does not include the fossil species, then, of course, the pretended coincidence between the biblical and the geological order of creation must be given up. In the second place, even if we admit the fossil species to be comprehended in the Mosaic account, the order in which we find them in the rocks, does not correspond with the statements in Genesis, if we suppose the days to be extended periods. Moses represents vegetables only to have been created on the third day, and no animals until the fifth: so that if these days were long periods, the earth must have existed a great while, nearly one third of its whole duration, (12 or 14 thousands of years, according to Faber,) covered only by plants. Hence we should expect to find about one-third of the fossiliferous

rocks, reckoning upward from the lowest, to contain only vegetable remains. But the fact is, animal remains are found as low among the rocks as vegetables; although perhaps in the very lowest, the latter are the most numerous: but taking in the whole of the graywacke group of De La Beche, animals are fifty times more numerous than plants. And the graywacke group does not by any means embrace one-third of the fossiliferous rocks. Again, according to the Bible thus interpreted, we ought to expect, after about one-third of the fossiliferous rocks were deposited, that those which follow should contain a great abundance of marine animals and birds: whereas in fact, when we have ascended through about one-third of the series, abounding in marine animals, we find a formation (the coal measures,) containing vegetable relics almost exclusively: and immediately above this, we come to an extensive group (the red sandstone formation,) containing but few animals or vegetables: and then a mixture of the two to the top of the series.

It seems to us, then, that if we confine our attention to organic remains, and suppose the Mosaic days to be extended periods, we shall find a marked discrepancy between the order of creation given in Genesis, and that shown us by the geological records. True, there is a remarkable coincidence between the two records, as to the state of the globe, before we have any evidence that it contained organized beings: But this has nothing to do with the theory which regards the Mosaic days as extended periods. It is an example of coincidence between geology and revelation, and not between any particular theory of interpretation and the sacred record. Yet if this be stricken out of Prof. Jameson's "table of coincidences," as well as his last item, which relates not to the Mosaic days, but to the deluge, there will be left only a feeble support to this peculiar theory; especially if, as we have endeavoured to show, there exists discrepancy, where he describes coincidence.

In conclusion of this extended view of the theory which expands the Mosaic days into indefinite periods, we cannot avoid the conclusion, that both philology and geology

present very powerful arguments against its adoption: And, therefore, nothing but the most urgent necessity, nothing but the conviction that we must either adopt it or abandon revelation, should lead us to admit it. In such a case, we should coincide with the opinion of Sharon Turner. "If," says he, "there were an absolute necessity of making such an election, it would be most reasonable to coincide with their idea" (who advocate this theory.) * "We are not by any means sure, with Mr. Faber and others," says the Christian Observer, "that with a view to make geology and Scripture coincide, it is necessary to construe the word 'day' in the first chapter of Genesis, as meaning an indefinite and lengthened period of time; but even if it be so, it is a less terrific conclusion that this is the right sense,—than that the Bible says one thing, and the undeniable phenomena of the earth's structure another. †" But we are far from believing that any such alternative as this exists. And such is the opinion of many of the ablest geologists in Europe. "Another indiscretion," says Professor Sedgwick, "has been committed by some excellent Christian writers on the subject of geology. They have not denied the facts established by this science, nor have they confounded the nature of physical and moral evidence: but they have prematurely endeavoured to bring the natural history of the earth into a literal accordance with the book of Genesis—first, by greatly extending the periods of time implied by the six days of creation (and whether this may be rightly done, is a question only of criticism and not of philosophy,) and secondly, by endeavouring to show, that, under this new interpretation of its words, the narrative of Moses may be supposed to comprehend and describe in order, the successive epochs of geology. It is to be feared that truth may, in this way, receive a double injury; and I am certain, that the argument just alluded to, has been unsuccessful." ‡

* Sacred History of the World, Vol I. p. 34.
† London Christian Observer, 1833, p. 743.
‡ Sedgwick's Discourse.

It has been already remarked, that most commentators on the Bible reject the interpretation which extends the length of the Mosaic days. It ought to be mentioned, however, that very few of them, perhaps none, have been practically acquainted with geology: and therefore their opinions on this point have less weight than in cases where philology only is concerned. Judging by philological rules only, the most distinguished among them are very decided as to the meaning of "day." "Many of those," says Rosenmüller, "who believe that things did really originate as here explained, by those six days understand periods of many days or years, evidently contrary to all the laws of interpretation, and the scope of the whole narrative; notwithstanding what Hensler may say," &c. * "As to the views of our author, in respect to the length of the days and nights at the creation," says Professor Stuart, "nothing can be plainer than that *usual* days and nights are meant. How could he say, that '*the evening* and *the morning* made them,' if this be not true?" † But it is unnecessary to multiply authorities on this subject.

11. *Another mode of interpreting the Mosaic account of the creation, so that it shall accord with geology, supposes the inspired account to be a pictorial representation of the successive production of the different parts of creation, having truth for its foundation, yet not to be regarded as literally and exactly true.*—The terms employed, however, are to be understood in their literal and common acceptation, as, for instance, the word *day*, which means a period of 24 hours. This theory we have met with only in Knapp's Theology; and as we are in doubt whether we understand every part of it, we shall let him speak for himself.

As a preface to his exegesis, Dr Knapp states a prin-

* Plures eorum qui rerum origines, ut vere sint factae, hic expositas, per sex illos dies periodos plurium aut dierum aut annorum intellexerunt plane contra omnes interpretandi leges totiusque narrationis indolem, quicquid dicat Henslerus, &c.

Rosem. in Vet. Test. Leipsic, 1828.

† Hebrew Chrestomathy, p. 118. Andover, 1829.

ciple of great importance, but too often forgotten by commentators:—

"The whole representation which Moses has given of the creation of the world," says he, "is as simple as possible, and such as doubtless was perfectly intelligible to those who lived in that infant age of the world, and is still so to men in common life. In the Bible, God speaks with men after the manner of men, and not in a language which is beyond the comprehension of most of them, as the learned would fain make it to be. Well, indeed, is it for the great mass of mankind, that the learned were not consulted respecting the manner in which the Bible should be written.

"The general subject of this passage is indicated in the first verse (of Genesis.) This is then enlarged upon in the following verses, not to gratify the curiosity of scientific men, but to meet the wants of those who lived in the age in which it was written, and of common men in all ages. This amplification is entirely simple and popular; and the work of creation is here represented as a *six days' work*. It is to be considered as a picture in which God appears as a human workman, who accomplishes what he undertakes only by piecemeal, and on each successive day lays out and performs a separate portion of his business. By such a representation the notion of the creation is made easy to every mind; and common people seeing it so distinctly portrayed, can form some distinct conceptions concerning it, and read or hear the account of it with interest.

"If we would form a clear and distinct notion of this whole description of the creation, we must conceive of six separate *pictures*, in which this great work is represented in each successive stage of its progress towards completion; and as the performance of the painter, though it must have natural truth as its foundation, must not be considered or judged of as a delineation of mathematical or scientific accuracy, so neither must this pictorial representation of the creation be regarded as literally and exactly true.

"The hypothesis of modern naturalists respecting the

material of our globe, can neither be confirmed nor refuted from the writings of Moses. Which of all those which have been suggested is true, whether that of Whiston, who supposes the earth to be formed from a comet,—that of Leibnitz, who makes it a sun burnt out,—that of Buffon, according to whom all the heavenly bodies are fragments, broken off from the body of the sun by the concussion of a comet,—or that of Wideburg, who supposes the earth to have been originally a *spot on the sun*,—must be determined on other grounds than the testimony of Moses.

"All these learned speculations and inquiries respecting the material of the earth, &c. lie beyond the object and sphere of Moses; and any of these hypotheses of the naturalist may be adopted or rejected, the Mosaic geogony notwithstanding." *

Thus far Dr. Knapp seems to yield to the geologist all he asks for in the interpretation of the sacred record; for he asks only that time may be allowed, previous to the creation of man, for the changes which he finds to have taken place among the rocks: and since Dr. Knapp abandons the idea that the heavens and the earth, with all their host, were actually created in the space of six literal days, we see not why, according to this interpretation, the real time employed in the work may not be extended to millions of years, as well as to one thousand years, or to one year. It is obvious, however, that Dr. Knapp had no idea of only a moderate extension of the demiurgic period, beyond the date usually assigned for the commencement of the universe; for he says, that "from this history of the creation, it follows that our globe, and the race of men that now dwell upon it, is about six thousand years old. I say *about* six thousand years; for Moses does not give us an exact chronology," &c.† Dr. Knapp does not seem to be aware of the vast periods of time which modern geology shows to have been requisite for the formation of the present crust of

* Knapp's Lectures on Christian Theology, Vol. I. pp. 355, 356, and 360.

† Ib. Vol. I. p. 357.

our globe; for he quotes only the opinions of some who flourished during the last generation, and who thought that perhaps a thousand years added to the date of man's creation would be sufficient for this process; and he quotes some distinguished names, Linnæus, Haller, and De Luc, who judged even this extension of the demiurgic period unnecessary. But had he been acquainted with the present state of geological science, we see not why his theory of interpretation would not have allowed him to extend this period indefinitely, after abandoning the strictly literal interpretation. And the more we reflect upon his views, the more inclined are we to regard them as one of the best modes that have been proposed for reconciling apparent discrepancies; and we earnestly recommend them to the serious consideration of every friend of revelation who is a geologist. They are certainly far more satisfactory than the theory that understands the demiurgic days as periods of indefinite length; and even perhaps than the remaining ones, which we have to state.

12. *Some have maintained that our present earth was formed out of the ruins of a former world, and that the creation described in Genesis was merely a re-arrangement of these materials.*

"We are not called upon," says Bishop Sumner, "to deny the possible existence of previous worlds, from the wreck of which our globe was organized, and the ruins of which are now furnishing matter to our curiosity."* "Geology," says another able writer, "goes further than the Mosaic account, in showing that the present system of this planet is built on the wreck and ruins of one more ancient."† In our quotations from Dathe and Doederlin, on a former page, it appears that views similar to those of Bishop Sumner are very prevalent in Germany. They differ from the next mode which we shall describe of interpreting the Mosaic account, so as to correspond with geology, only in supposing that the former world on

* Records of Creation, Vol. II. p. 356.
† Vindiciae Geologicae, p. 24.

which our present fossil animals and plants lived and died, was destroyed, and the earth reduced to a chaotic strata, from which God redeemed it during the six days of creation. Indeed, we have very much doubted whether, in the minds of most writers, there is any distinction between these two theories; for they use language which seems to imply, that when they speak of the "wreck" and "ruins" of a previous world, they mean nothing more than that a widely different state of things formerly existed on the globe, so that in some sense it might be called another world; and some great change must have taken place before the present order of things was established, and the present races of animals and plants was created. But if they do mean that in early times this globe was for a long period in a state similar to the present, as to climate and temperature, so that the existing races of animals and plants might have inhabited it, and that afterwards it was reduced again to a chaotic state, they are unsustained in such opinions by geological facts. There is no evidence that there has ever been any deterioration in the condition of our planet, except for a short period at the time when some general catastrophe happened; for in the end it appears that every change has been improvement in its condition. The crust of the globe is not a confused mixture of the fragments of former worlds; but the formations are superimposed upon one another in as regular a manner as the drawers of a well-regulated cabinet. True, the strata have been mostly fractured and tilted up, and sometimes dislocated; but all this has rarely disturbed their order of superposition. To the superficial observer there is an appearance of confusion and ruin; but a thorough examination shows that this is a deception. Every thing demonstrates that the globe has undergone a succession of changes, slow in their consummation, though attended often by paroxysmal efforts, fitting it for races of animals and plants successively more complicated and delicate in their organization, until at last, about 6000 years ago, it became adapted to be the probationary state of moral and intellectual beings. There is certainly no evidence of a

middle state of desolation and chaos, between an earlier and a later condition, adapted to animal and vegetable natures.

" The earth," in the eloquent language of Professor Silliman, " is unlike Memphis, Thebes, Persepolis, Babylon, Balbec, or Palmyra, which present merely confused and mutilated masses of colossal and beautiful architecture, answering no purpose, except to gratify curiosity, and to awaken a sublime and pathetic moral feeling;—it is rather, like modern Rome, replete indeed with the ruins of the ancient city, in part re-arranged for purposes of utility and ornament, but also covered by the regular and perfect constructions of subsequent centuries."*

It is only against that point of this theory which regards the crust of the globe as a confused mass of ruins, derived from an earlier world, that we object. But the argument in favour of, and against the leading principles of the theory, viz. that which supposes the Mosaic account to pass in silence a long period between the original creation of the globe and the creation of our present races of plants and animals—these arguments we shall examine under the next reconciling theory, which we now proceed to consider.

13. *Some propose to solve the geological difficulty, by maintaining that Moses does not fix the time of the first creation of the universe, but only states the fact that God made it; and then, passing in silence an unknown period of its duration, he proceeds at once to describe the work of filling up this world for its present inhabitants with their creation, which occupied six days, and took place less than* 6000 *years ago.*—During the long interval between the original production of the matter of the globe and the six days' work, numerous races of animals might have been created and destroyed, which Moses does not describe; because they had little more connection with our present races than the organized beings on other planets, if such there be, and therefore their history could not subserve at all the object of a revelation

* Bakewell's Geology, p. 436.

intended for moral not scientific purposes. Of what possible use could it have been in such a revelation to give an account of the creation and extinction of certain races of tropical plants and huge animals, whose remains were buried deep in the earth, and would be brought to light only after the lapse of thousands of years by the researches of geologists?

We shall now give a brief outline of the arguments by which this theory of interpretation is defended, as well as the objections that may be urged against it.

1. The sacred record admits of this interpretation without doing any violence to the language. It is clear to the most superficial reader, that the time when the universe was first created is not fixed in the first verse of Genesis. The phrase, *in the beginning*, is as indefinite in respect to time as language well can be. It signifies, in this verse, merely *at first*. "By the phrase בְּרֵאשִׁית," says Doederlin, "the time is declared when *something began to be*. But *when* God produced this remarkable work, Moses does not precisely define,—either because the chronological relations of the world have but little to do with religion, or because our modes of reckoning are transferred with extreme difficulty to the celestial cycles, and time cannot be conceived of without a succession of events." *

It may perhaps be difficult to ascertain, with entire certainty, where Moses begins the six days' work in his narrative; but it is quite clear that the first verse at least may be regarded as entirely independent of the six days. It is merely a general declaration that God at the first created the universe; and seems to be distinctly separated from the six days' work, as if it were a previous operation at some undefined period of the past. Sound

* Tempus voce בְּרֵאשִׁית declaratur *cum aliquid esse incipiperet*. Verum *quando* insigne opus edideret Deus Moses non praecise finit, sive quia parum ad religionem chronologicae mundi rationes conducunt, sive quia numeri nostri minime possunt ad rationes coelestes transferri, nec tempus sine rebus sibi succedentibus cogitari potest.—*Doederlinii Theologia*, p. 477.

criticism will probably allow us to go further than this, and to regard the second verse of Genesis as a description of the condition of the earth previous to the commencement of the six demiurgic days.

It is well known that the Hebrew particle ו, used to connect the different parts of the Mosaic account of the creation, "discharges the functions of all the conjunctions, both copulative and disjunctive,—its sense being determinable in each particular case, only by the relation of the context, and the practice and genius of the language."* The elder Michaelis assigns to it thirty-seven different significations, and Noldius upwards of seventy. In most modern versions of the Old Testament, this particle is rendered by *and* in the whole of the first chapter of Genesis. But the Septuagint, as well as Josephus, give it in some places the sense of Δέ—*but*. Rosenmüller gives it still more latitude of signification, and thinks it may be translated adverbially. He is of opinion that the first three verses of Genesis may be understood in either of the following senses:—

"In the beginning God created the heaven and the earth. *Afterwards*, the earth was desolate," &c. Or,—"was desolate, and darkness was upon the face of the waters. *Afterward*, the Spirit of God," &c. Or,—"the Spirit of God blew upon the face of the waters. *Afterwards*, God said, let there be light."

"Whichever of these explications you adopt, it must denote a twofold creation:—1. The first production of all things; 2. The renovation of this earth. But it will be asked, which of these three interpretations is to be preferred to the others? That point I cannot settle."†

But even if we do not adopt this interpretation of this distinguished critic, it seems clear to us that the first chapter of Genesis, (in the words of Mr. Higgins,) "may be divided into three periods:—First, there is a statement that the heavens and earth were formed by God, (ver. 1.) There is then a description of the earth pre-

* Penn's Comparative Estimate of the Mineral and Mosaical Geologies, Vol. I. p. 166.

† Antiquiss. Tell. Hist. p. 27.

vious to the days of creation (ver. 2.); and afterwards a somewhat detailed account of the order in which the Almighty furnished the world during the six days."* It seems to us that this is precisely the impression that would be made upon a plain unlettered man of good sense from a perusal of this chapter, without any previous bias; or at least, even if such a man might be led to regard the first day's work as including the second verse, yet, to use the language of the London Christian Observer, "there seems to be more of naturalness in making the first verse one grand distinct universal proposition, than in mincing it up with the details of the first day's work. Following up the allusion of the apostle, who compares the Sovereign Creator to a potter making one vessel to honour and another to dishonour, is there any irreverence, or any thing contrary to the sacred text, or to the analogy of faith, in supposing that He first formed, as it were, the clay out of which he afterwards constituted all things; and that after an interval, in which he perhaps caused it to undergo various subordinate processes, with which we have no concern, and which therefore are not detailed to us in Holy Writ, any more than the particulars of the solar system or the theory of comets—He at length placed it as it was, keeping up the sacred allusion, upon the wheel, to form our present world, the record of which, in reference to the history of mankind, is the direct object of Revelation—and with six successive operations of Almighty plan and skill, made what it became, when he pronounced that it was very good?"†

It can hardly be considered an objection to these views, by any one tolerably conversant with the divine records, that Moses does not distinctly mention this long inter-

* The Mosaical and Mineral Geologies illustrated and compared, by W. H. Higgins, p. 133. Notwithstanding the many excellent views taken in this little work, we cannot but express our astonishment that W. H. Higgins, F. G. S. &c., Lecturer on Natural Philosophy at Guy's Hospital, London, should be so ignorant of geography, as to represent (see p. 119) the Missouri and the Mississippi to be within the tropics!

† Christian Observer, June 1834, p. 385.

vening period, nor the events which transpired therein; for nothing is more common than such omission, where the intervening events were unnecessary to the purpose of the writer. For instance, Exodus ii. 1, 2, it is said, *And there went a man of the name of Levi, and took to wife a daughter of Levi. And the woman conceived and bear a son* (Moses): *and when she saw that he was a goodly child, she hid him three months.* Now, suppose this was the only account given in the Bible of the family of this Levite, who would have suspected that Moses had an elder brother and elder sister? But suppose that evidence of this fact had first been brought to light in the nineteenth century by deciphering Egyptian hieroglyphics, who would hesitate to admit the truth of the statement, merely because it was omitted in the Pentateuch? or who would regard such omission as an impeachment of the Divine record? Now then, suppose that the first intimation we have of a long interval between the first creative act and the six days' work be derived from geology, shall we regard the mere silence of Moses on the subject as proof of the non-existence of such an interval, especially when the second verse of Genesis may very naturally be understood as a description of such a condition of the earth?

As to the condition of the earth during this intervening period, we have already given our views, so far as geology throws light on the subject, in discussing the connection between that science and natural religion, in a former number of this work.* We have there disavowed the notions that have so widely prevailed respecting a *chaos*, and maintained that the same laws of nature were in operation then as at present; and that the only difference between the early, or what is called the chaotic state of the globe, and the present, is, that the relative intensity in the operations of different causes has changed, so that some causes which were formerly very active are now very feeble, and *vice versa*. The consequence has been a change in the condition of the globe, with a

* See Cabinet Library of Useful Tracts, No. II.

correspondent change of organized beings upon its surface.

This view of the primeval "chaos" is not contradicted, but rather sustained by the Mosaic account. The celebrated תֹּהוּ וָבֹהוּ of Genesis, has long been regarded as synonymous with the heathen chaos; and our common translation—*without form and void*—certainly favours this idea. But we apprehend this rendering is not sustained by correct criticism. The older Jewish writers, Philo, Josephus, and the authors of the Septuagint, render these words, by ἀόρατος καὶ ἀκαταασκεύαστος—*invisible and unfurnished;* and this meaning corresponds nearly with that which the most eminent modern philologists attach to the words. "It is wonderful," says Rosenmüller, "that so many interpreters could have persuaded themselves that it was possible to detect a *Chaos* in the words תֹּהוּ וָבֹהוּ. That notion unquestionably derived its origin from the fictions of the Greek and Latin poets, which were transferred by those interpreters to Moses. —If we follow the practice of the language, the Hebrew phrase has this signification: *The earth was waste and desert*, or, as others prefer, *empty and vacuous*, i. e. *uncultured and unfurnished* with those things with which the Creator afterwards adorned it."*

2. This theory of interpretation derives some confirmation from the changes which modern astronomy shows us to be going on in other worlds. In discussing the connection between geology and natural religion, we have inferred from what is known of the moon, the sun, and especially of the comets, that they are gradually

* Mirum est multos interpretes *Chaos* his verbis, תֹּהוּ וָבֹהוּ, indigitari sibi persuadere potuisse—Originem debet haec opinio sine dubio Poetarum Graecorum Latinorum figmentis, ab interpretibus Mosi illatus—Si itaque usum linguae sequimur phrasis Hebraica hunc habet sensum: *terra fuit vasta* et *deserta*, vel ut alii malunt, *inanis et vacua*, i. e. *inculta*, nec rebus *instructa erat*, quibus postea Creator, eam ornavit.—*Antiquiss. Tell. Hist.* p. 19—23.

passing from a state of desolation to one adapted for the residence of organized beings. There is evidence, for instance, that those comets whose periodical time is known, appear to be more condensed at each return. Indeed, though we catch, as it were, only feeble glimpses of the geology of other worlds, yet, if we mistake not, they give us a partial view of a great principle in the universe, by which God regulates and preserves it,—viz. the principle of perpetual change, of ceaseless decay and renovation. And when we find in the Mosaic history so distinct an allusion to a former state of the globe, corresponding to the operation of such a principle, we cannot but feel strengthened in the opinion that we have hit upon the right mode of interpreting that history.

3. This interpretation has been sustained by many of the ablest philologists, theologians, and geologists of modern times. And although names, however distinguished, can never prove that true which is false, yet when we find a large number of distinguished men embracing any opinion,—and we know of no prejudice that has influenced them,—it is not in human nature to feel no confirmation of our belief in that opinion; for we very naturally infer, that such an opinion must have good reasons for its foundation to commend itself to the judicious and discerning. In respect to the interpretation of Genesis under consideration, we have already quoted the opinion of one distinguished German theologian, and one well known and able philologist. We will add a few more brief extracts:—

"Were we to concede to naturalists," says Baumgarten Crusius, "all the reasonings which they advance in favour of the earth's earlier existence, the conclusion would only be that the earth itself has existed much more than 6000 years, and that it had then already suffered many great and important revolutions. But if this were so, would the relation of Moses thereby become false and untenable? I cannot think so. Without at all failing of his aim, Moses may very properly have limited himself to the narrative of the earth's formation,—to its being made habitable for man, and to the origin

of the beings that dwell upon it, especially the human race."*

The views of Bishop Patrick are very interesting, because he wrote more than 150 years ago, and therefore could not have been influenced by modern geology.

"Moses," says he, "in the words תֹּהוּ וָבֹהוּ ('without form and void,') gives a description of that which the ancients called *chaos*, wherein the seeds and principles of all things were blended together, which was indeed the first of the works of God, who, as Moses shows us in the sequel, produced this beautiful world out of this chaos. How long all things continued in mere confusion after the chaos was created, before this light was extracted from it, we are not told. It might be (for any thing that is here revealed) a great while; and all that time the mighty Spirit was making such motions in it, as prepared, disposed, and ripened every part of it, for such productions as were to appear successively in such spaces of time as are here afterwards mentioned by Moses, who informs us that after things were digested and made ready (by long fermentations perhaps) to be wrought into form, God produced every day, for six days together, some creature or other till all was finished, of which light was the very first."†

"The interval," says Bishop Horsley, "between the production of the matter of the chaos and the formation of light, is undescribed and unknown." ‡

"Does Moses ever say that when God created the heavens and the earth," says Dr. Chalmers, "he did more at the time alluded to than transform them out of previously existing materials? Or does he ever say, that there was not an interval of many ages betwixt the first act of creation, described in the first verse of the book of Genesis, and said to have been performed at the *beginning*, and those more detailed operations, the account of

* Schrift.

† Commentary on Genesis.

‡ Biblical Criticisms, as quoted in Penn's Comparative Estimate, Vol. I. p. 200.

which commences at the second verse, and which are described to us under the allegory of days? Or does he ever bring forward any literal interpretation of this history, which brings him into the slightest contact with the doctrines of geology? Or, finally, does he ever make us to understand that the genealogies of man went any further back than to fix the antiquity of the species, and of consequence that they left the antiquity of the globe a free subject for the speculations of philosophers?"*

"We do not know," says Sharon Turner, "and we have no means of knowing, at what point of the ever-flowing eternity of that which is alone eternal—the Divine Subsistence—the creation of our earth, or of any part of the universe began, nor in what section of it we are living now. All that we can learn explicitly from revelation is, that nearly 6000 years have passed since our first parents began to be. Our chronology, that of Scripture, is dated from the period of his creation; and almost 6000 years have elapsed since he moved and breathed a full formed man. But what series of time had preceded his formation, or in what portion of the anteceding succession of time this was effected, has not been disclosed, and cannot, by any effort of human ingenuity, be now explored. Creation must have begun at some early part of anteceding eternity; and our earth may have had its commencement in such a primeval era, as well as in a later one."

We will subjoin the opinion of a few of the ablest living European geologists, who are Christians.

"Moses," says Dr. Buckland, "does not deny the existence of another order of things prior to the preparation of this globe for the reception of the human race, to which he confines the details of his history—there is nothing in the proposition inconsistent with the Mosaic declaration of the creation."

"The geologist," says Mr. Sedgwick, "tells us, by the clearest interpretation of the phenomena which his labours have brought to light, that our globe has been

* Evidences of Christianity, p 107. Philadelphia, 1833.

subject to vast physical revolutions. He counts his time not by celestial cycles, but by an index he has found in the solid framework of the globe itself. He sees a long succession of movements, each of which may have required a thousand ages for its elaboration. Periods such as these belong not to the moral history of our race, and come neither within the letter nor the spirit of revelation. Between the first creation of the earth and that day when it pleased God to place man upon it, who shall dare to define the interval? On this question Scripture is silent," &c.—" The only way to escape from all difficulties pressing on the questions of cosmogony has been already pointed out. We must consider the old strata of the earth as monuments of a date long anterior to the existence of man, and to the times contemplated in the moral records of his creation. In this view there is no collision between physical and moral truth."*

" It is only," says Dr. Macculloch, " for an antiquity prior to the creation of man that geology asks. From that moment it is reconcilable to the sacred chronology. —All that geology requires for the utmost scope of its great investigations, is comprised in the time which is included in the first and second verses of the history. This is the undefined period with which it is alone concerned; and if the time be truly here indefinite, the difficulty is solved. The historian has left the interval between the creation of the universe, and that of light indefinite; as he is silent on what may have occurred: and here science is free to pursue the investigation by its own rules." †

Dr. Macculloch mentions the two following items of evidence in favour of this interpretation, which we have not noticed, because we are in doubt whether they are of much, if of any weight.

" That the original creation, and the subsequent arrangement, were viewed as different by the historian himself, seems also to follow from the expressions used,—confirming the opinion that he is speaking indefinitely in

* Sedgwick's Discourse on the Studies of the University, pp. 25, and 149, and 154.

† System of Geology, Vol. I. pp. 62, 63. London, 1831.

the first verses, and that, in the subsequent account, he has commenced the history of our present earth. The word first used is בָּרָא, which means, literally, to create, or to call from non-existence into existence. This verb is again used when man and when whales are created, as this was a real creation; but the term יָצַר is applied to other cases. It is another proof that the period of the original creation is intended to be indefinite, when we find בָּרָא used in the absolute past, while all the verbs which follow are in the present or future form,—confirming the opinion of the complete separation, in the historian's mind, of those two periods, and of the creation of the six days as entirely distinct from the original creation of the world."*

We shall now briefly consider those objections to the method of interpretation under consideration, which appear to us of the most importance.

1. It is thought by some that this theory is insufficient to reconcile the Mosaic and the geological records. "This theory," says Professor Silliman, "is satisfactory as far as it goes; and it would be quite sufficient to reconcile geology and the Mosaic history, as usually understood, did not the latter assign particular events to each of the successive periods called days,—the most important of these events are the first emergence of the mountains, and the creation of organized beings. It seems necessary, therefore, to embrace the days in the series of geological periods; and the difficulties of our subject will not be removed, unless we can show that there is time enough included in those periods called days to cover the organic creation, and the formation of rocks, in which the remains of these bodies are contained."†

We confess we do not feel the force of this objection. Suppose we admit that certain events are assigned to each of the demiurgic days; and that the organic remains are found arranged in the strata, precisely in the order in

* System of Geology, Vol. I. p. 64.

† Bakewell's Geology, p. 489. New Haven, 1833.

which Moses declares organic beings to have been created. What improbability is there in supposing that there may have been several repetitions of certain demiurgic processes since the earth began to exist? Does not the constancy of nature's operations render such a repetition probable? But if we mistake not, we have shown in another place, that if Moses' account includes the creation of those organized beings now found in a fossil state, it cannot include existing species; and if it include the latter, it must exclude the former. The only way of avoiding one of the horns of this dilemma that is at all plausible, is to say, that Moses describes only the first example of each class of organized beings that was created, and that numerous other creations of similar animals and plants took place at successive, and perhaps long intervals afterwards, of which he has left no record. That is to say, Moses describes the creation of those animals and plants which are buried deepest in the rocks, and not existing races; except perhaps man and some of the quadrupeds. Now the supposition that Moses does not mean the present races of organized beings as created during the six days, is so unnatural, that we can hardly imagine any reasonable man would adopt the opinion. Besides, he represents these very animals which had been created as subject to the dominion of man, and the plants as meat for the animals. Does he mean plants and animals that would be created some 50 or 100,000 years afterwards? *Credat Judaeus Apella, non ego.* The fact is, we are beset with insuperable difficulties, until we admit that Moses does not describe fossil species. This being granted, most of our difficulties vanish.

For the sake of argument we have admitted that the order of the creation as described in Genesis, corresponds with the order in which organic remains are deposited in the rocks. But in another place we have shown, we think, that no such coincidence exists; and this we regard as additional evidence that the fossil species are not described by Moses. But if there be no such coincidence, then the objection to the theory under consideration, derived from this source, falls to the ground.

2. If fossil species were created before the six days of creation, then, they must have flourished before the existence of light: for the production of this was certainly a part of the first day's work: and that light was in existence when these fossil animals lived, is evident from the fact that some of them at least were provided with organs of vision.

From the facts which modern science has developed as to the existence of light and heat in all bodies, we can hardly imagine that these were not created in the beginning, along with matter. But these facts show us that they might have existed without being visible, or that after having been visible during ages, they might have been absorbed into matter, and that it required the power of Almighty God to develope them to such an extent as was necessary for the new state of the earth; that is to say, it was rather a recreation than an original production of light that is described in the third verse. It is very analogous to the case of the sun and moon, which most critics suppose were created on the first day, but developed and placed in their present spheres not until the fourth day.

3. The fact, however, that our translation represents the work of the fourth day to be the creation of the sun, moon, and stars, is urged as an objection against the theory of interpretation under consideration. And if we must admit that these bodies did not exist till the fourth day, it furnishes, indeed, a strong argument against the position maintained in this theory. For the mind at once perceives the improbability, that the earth should have been created and stocked with inhabitants, thousands of ages before the existence of the heavens, or any of those worlds which form the present system of the universe.

The reply to this objection is, that the heavenly bodies were created before the fourth day: for Moses expressly declares that the "heavens," as well as the earth, were created *in the beginning:* and who can doubt but that by *heavens and earth,* he means the universe? It is true that our common English translation conveys the idea

that the sun, moon, and stars were brought into existence on the fourth demiurgic day: but we very much doubt whether the *original* implies any thing more than that on that day these bodies had their offices and stations assigned them: in other words, that the present arrangement of things in the heavens was then first completely established.

On another page we have quoted a passage that shows the Hebrews to have adopted this view of the subject; although, according to Vatablus, most of the Greek and Latin writers maintained a contrary opinion. Origen, however, was an exception. * Some of the ablest modern philologists adopt the view taken by the Hebrews:

"Hitherto," says Hensler, "the only way of distinguishing day from night was, that in the day time it was lighter, and in the night darker. Through a perfectly visible rising and setting of the sun, a more perfect boundary of day and night resulted. In the language of the *original*, not indeed expressed with mathematical accuracy, it is said, 'God said, now let the lights in the firmament of the heavens distinguish between day and night, and they shall mark appointed times, days, and years: they shall lighten the firmament of the heavens to shine upon the earth; and it was so. Of the two great lights, God placed the greater to rule the day, and the smaller, together with the stars, to rule the night.'" †

Granville Penn thinks the following to be a correct interpretation of the fourth day's work. "Let it be, that the lights in the firmament of heaven, for dividing between the day and the night be for signs, and for seasons, and for days, and for years." ‡

"If any one," says Rosenmüller, "who is conversant with the genius of the Hebrew, and free from any previous bias of his judgment, will read the words of this article (Gen. i. 14, 15, 16, 17, 18, 19.) in their natural connection, he will immediately perceive, that they im-

* Philosophical Magazine, Vol. 47. p. 262.
† Bemerkungen über stellen, &c.
‡ Comparative Estimate, Vol. I. p. 228.

port the direction, or determination of the heavenly bodies to certain uses which they were to render to the earth. The words מְאוֹרֹת יְהִי are not to be separated from the rest, or to be rendered *fiant lmminaria*, let there be lights; i. e. *let lights be made;* but rather, *let lights be*, that is, *serve in the expanse of heaven, for distinguishing between day and night; and let them be, or serve for signs, &c.* For we are to observe, that the verb הָיָה *to be*, in construction with the prefix *for*, is generally employed to express the direction or determination of a thing to an end; and not the production of the thing."— "The historian speaks of the determination of the stars to certain uses which they were to render to the earth, and not of their first formation." *

We might multiply authorities in favour of this interpretation: but it is unnecessary. Suffice it to say, that there is a decided preponderance among the ablest commentators in favour of this view of the subject.

4. The language of the fourth commandment is thought to be decisive against the opinion that a long period preceded the demiurgic days. This expressly declares that *in six days the Lord made heaven and earth, the sea, and all that in them is, &c.* Now, on what principle of interpretation shall we introduce a period thousands of ages, long before the six days commenced, when Moses expressly embraces all the creative processes in those days?

We confess that such is not the natural meaning of the words of this passage; that is, it does seem to teach the creation of the whole universe in six literal days: And it is certainly an objection to the proposed mode of interpretating the Mosaic account of the creation, which deserves a very serious consideration. For it must demand quite decisive proof before we can admit, that the natural and obvious meaning of a writer is not the true meaning. There is, however, a principle of interpretation applicable in this case, which may perhaps satisfy

* Quoted in Penn's Comparative Estimate, Vol. I. p. 225, and 229.

every mind, that the supposed existence of a long period anterior to the Mosaic days, is perfectly consistent with the fourth commandment. We refer to the principle, that, when a writer describes the same event in more than one place, *the briefer statement is to be interpreted in accordance with the more extended one.* We can refer to an illustrative example in Genesis, relating to the subject of creation. In Chapter ii. v. 4, it is said, *These are the generations of the heavens and of the earth, when they were created, in the day that the Lord God made the earth and the heavens.* Now, if this were the only account in the Bible of the work of creation, who would have suspected that more than a single day was occupied by it? But the statement in the first chapter of Genesis compels us to attach a meaning to the words just quoted, different from the natural and obvious one: nor does any one acquainted with the laws of exegesis, imagine that there is any real discrepancy between the two statements. On the same principle, is it not reasonable to explain the fourth commandment by comparing it with the more extended account of the creation, in the first chapter of Genesis? It is not, indeed, as clear from the statement in Genesis, that a long period intervened between the creation and the Mosaic days, as that six days were employed in the demiurgic processes. But still we can hardly conceive how any candid man can deny that the first four verses do naturally admit such a period. We cannot, therefore, allow that the fourth commandment is insuperably opposed to the interpretation under consideration.

The conclusion then to which we come respecting this theory of reconciliation is, that though not entirely free from difficulty, it is the most probable that has been proposed, and it is accordingly adopted by more able geologists and philologists at the present day than any other.

14. *But finally, even if none of the modes of reconciling the two records that have been examined, are satisfactory, we still maintain that it would be premature, in the present state of geology and of sacred philology, to infer any real discrepancy between them.*

1. In the first place, the great mass of evidence by which the truth of the Bible is sustained, independent of geology, furnishes a strong presumption of its veracity in every case. For we are slow to believe a man guilty of falsehood, when the testimony to his veracity is strong from almost every quarter: and why should we not act on the same principle in relation to Moses? So strong is the proof of the authenticity and inspiration of the sacred record, that even if a *point blank* inconsistency could be made out between it and geology, the latter must yield, because it is not sustained by proof so strong as revelation. Nothing however but the direct necessity ought to lead us to resort to such a mode of vindicating the sacred record: for in sceptical minds at least it would destroy all the practical influence of Christianity. But it is reasonable when an apparent discrepancy is seen between revelation and geology, to wait till we are sure we understand the subject fully before we pronounce the former to be erroneous. And who is there that will pretend that no new light can possibly be thrown upon the connection between the two subjects?

2. The recent origin and rapid progress of geology show us the unreasonableness of hasty judgment against revelation. A few years since, Humboldt said, that "to boast of stability of opinion in geology, is to boast of an extreme indolence of mind: it is to remain stationary amidst those who go forward." And another lecturer on this science has more recently said, that "geology is as yet only in its cradle, and its nurses have scarcely recognized the features of its countenance." * These statements we regard as too sweeping, and as inapplicable to their full extent to geology. For within a few years the great fundamental principles of the science have been settled beyond all dispute: and thus fixed do we regard the fact that this world has existed through a very long period of time anterior to the creation of our present animals and plants. But there are some things in geology yet unsettled, and it would be unreasonable to infer that fu-

* Higgins's Mosaical and Mineral Geologies, p. 2.

ture discoveries in that science will not throw any real light upon the connection between the revealed and the observed cosmogonies. Hence every candid man will be disposed to wait for a time before pronouncing the existence of real discrepancies.

3. The great number of remarkable coincidences between the two records, as already pointed out by us, is another reason for delaying a decision against revelation; for these coincidences relate to numerous points where the two subjects come in contact, whereas the discrepancy relates to a single point,—viz. the age of the world. The presumption, then, even from geology alone, is decidedly in favour of revelation; and therefore a decision against it, in the present state of the question, would be absurd in the highest degree.

4. We ought also to recollect, that within a few years past, several apparent discrepancies between geology and revelation have disappeared with the progress of discovery. The unavoidable inference is, that the only remaining one may ere long vanish before the fast increasing light.

5. Finally, the exegesis of the first chapter of Genesis can be considered as by no means settled; and several of the points yet unsettled are precisely those that bear upon the geological difficulty. Can we believe that criticism has reached its *ne plus ultra* in eking out the meaning? Nay, may not geology itself put into the interpreter's hands the clue that will disentangle all difficulties? Philology, then, as well as sound philosophy, cries out in favour of delaying to decide against Moses until further developments have been made.

The conclusions, then, at which we arrive on this subject are these:—In the first place, we maintain that between geology and revelation there are several unexpected and remarkable coincidences, such as could have resulted only from veracity on the part of the sacred historian, and that the points of agreement are far more numerous than the points of apparent collision; and therefore even geology alone furnishes a strong presumptive evidence in favour of the truth of the Mosaic history.

We maintain, secondly, that the first chapter of Genesis is a portion of Scripture that has always occasioned much difficulty in its interpretation, apart from geology; and that those portions of it about which commentators have differed most, are the very ones with which geology is supposed to come into collision; so that, in fact, scarcely any new interpretation has been proposed to meet the geological difficulty. We admit, thirdly, that the geological difficulty is real,—that is, the established facts of geology do teach us that the earth has existed through a vastly longer period, anterior to the creation of man, than the common interpretation of Genesis allows. We maintain, fourthly, that most of the methods that have been proposed to avoid or reconcile the geological difficulty are entirely inadequate, and irreconcilably at variance either with geology or revelation. We maintain, fifthly, that at least one or two of these proposed modes of reconciling geology and Scripture, although not free from objections, are yet so probable that, without any auxiliary considerations, they would be sufficient, in the view of every reasonable man, to vindicate the Mosaic history from the charge of collision with the principles of geology. And, finally, we maintain, that though all these modes of reconciliation should be unsatisfactory, it would be premature and unreasonable to infer that there exists any real discrepancy,—first, because we are by no means certain that we fully understand every part of the Mosaic account of the creation;—secondly, because geology is so recent a science, and is making so rapid advances, that we may expect from its future discoveries that some more light will be thrown upon cosmogony;—and, thirdly, because as geology has been more and more thoroughly understood, the apparent discrepancies between it and revelation have become less numerous.

We now appeal to every reasonable man, whether we have not given at least a fair and candid examination of this subject. We appeal first to the theologian and the philologist; and inquire, not whether such an interpretation of Genesis as admits the duration of our globe through an unknown period previous to man is wholly free from

difficulties, but whether it has not so much plausibility, that it might be at least provisionally adopted, if demanded by the undoubted facts of science? What doctrine or precept of Revelation, except merely the chronology of the globe, but not of man, is at all affected by such an interpretation; unless it be, that it enlarges our views of the plans and the benevolence of the Deity? We have seen that several of the most distinguished theologians and commentators of the age have adopted this exposition; and we cannot but believe that all, whose views are enlarged and liberalized, and who are acquainted with the facts of geological science, will acquiesce in the sentiment of Bishop Sumner. "No rational theologian," says he, "will direct his hostility against any theory, which, acknowledging the agency of the Creator, only attempts to point out the secondary instruments he has employed." * Equally reasonable are the views of Doederlein. "It was allowable," says he, "for Whiston to maintain that the earth was originally a comet: or for Leibnitz to maintain that our world was an extinguished sun; for Buffon to suspect that our earth was a fragment struck off from the sun by the stroke of a comet; for Wideburgh to exhibit and illustrate the hypothesis that one of the sun's spots, being forced from its place and moving once as a comet over an eccentric orbit, was fixed in its present place, prepared and adorned for new races of animals: or for others to propose different theories of the earth, provided they agree in this, that this world, which we admire, received its present form and inhabitants about 5,600 years ago." †

We appeal, also, to any who are sceptical in respect to the truth of the Bible; and inquire of them, whether we have not given as much weight to the geological objections against revelation as they deserve? We apprehend that we shall generally be thought to have yielded more than the rules of moral evidence demand, or prudence approves. Nevertheless, have we not shown that there

* Records of Creation.
† Licuit Guil. Whistono.

is far more in geology to corroborate than to invalidate the testimony of Moses? that every remaining discrepancy admits of a probable, if not a demonstrable explanation; and that therefore, it is premature and unreasonable to believe that there exists any real opposition between the two records. What more can a logical philosopher in search of truth demand? Who would hesitate to pronounce the veracity of an uninspired writer fairly vindicated by such an array of evidence? And why should a severer test be demanded because a writer lays claims to a divine inspiration?

It is a matter of thankfulness for the friends of Revelation that those objections which have been derived from the science, to the truth of the Scriptures, have one after another vanished away just so soon as patient investigation had thrown the clear light of truth upon the subject. "It is now thirty-five years," says Sharon Turner, "since my attention was first directed to these considerations. It was then the fashion for science, and for a large part of the educated and inquisitive world, to rush into a disbelief of all written revelation; and several geological speculations were directed against it. But I have lived to see the most hostile of these destroyed by as hostile successors, and to observe that nothing which was of this character, however plausible at the moment of its appearance, has had any duration in human estimation, not even among the most sceptical."* Along the whole outskirts of science, infidelity has from time to time erected her imposing ramparts and opened a fire upon Christianity from a thousand batteries. But the moment the rays of truth were concentrated upon these ramparts, they melted away, mere airy castles as they were, magnified and made formidable only because they were seen through the mists of ignorance. Is it strange, that in fields so wide as geology discloses, and so recently thrown open to the daylight of truth, there should still be seen here and there a spot yet enveloped in mist? Is it strange, that scepticism, driven from every other field of contest, should

* Sacred History of the World, (Family Library), p. 37.

hold on to this last retreat with a death struggle? But the last cloud of ignorance is passing away, and the thunders of infidelity are dying upon the ear. On the retiring darkness the bow of Christianity appears blending its colours with the bow of science: a sure token that the flood of unbelief and ignorance shall never more go over the world!

PHILOLOGICAL VIEW

OF

THE MODERN DOCTRINES

OF

GEOLOGY.

BY

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EDINBURGH:

THOMAS CLARK, 38, GEORGE STREET.

MDCCCXXXVI.

JAMES BURNET, PRINTER, 23, EAST THISTLE STREET.

PHILOLOGICAL VIEW, &c.

THE public have much reason, as I view the matter, to thank Prof. Hitchcock of Amherst College, for his very valuable contributions on the subject of *Geology.* * He complains, and not without good reason, in the course of his essays, that our American public take as yet but little interest in the highly important science of geology. I would at least hope that his labours may serve to diminish the grounds of his complaint, and also to attract many to study and examine this matter, which seems to be most intimately connected with advance and improvement in the arts and sciences; so as to be better able to judge of the value, as well as of the correctness and importance of his communications. Sure I am, that more light and knowledge on this subject, as well as on every other connected with the knowledge of the works of God, cannot fail in the end to be promotive of good.

I am not at all surprised, that Prof. H. should repel with some degree of warmth the general and sometimes indiscriminate charge of scepticism, which is not unfrequently made here and there against geologists. That some among this class of men have been sceptical, and even atheistical,—some too whose names stand quite near to the head of the list as natural philosophers; the Professor readily admits. But why this should involve others in a charge of like scepticism, who altogether dis-

* See Students' Cabinet Library of Useful Tracts, Nos. II. and XIX.

avow infidel sentiments, and openly profess their belief in the Christian Revelation, it would be difficult to show on any ground of justice or of candour. Yet it is not difficult to account for the fact itself that such indiscriminate accusations are made, when one looks abroad and examines into the ways and means to which antagonists of particular views and sentiments often resort, in order to carry a point. Is the subject geology, and do they reject with strong antipathy some of the sentiments which a geologist has advanced? Then do they transfer their antipathy to these sentiments, not only to the individual who has broached them, but to all who, like him, are geologists. To take it for granted that all who pursue the study of the same science, must adopt the same particular views as to matters of doubt and difficulty, is indeed making large strides in the way of assumption; and Prof. H. has reason enough to complain aloud of such a proceeding. Yet the science of geology does not stand alone in this respect. Philology and theology receive a pretty full measure of the like treatment. Does a man enlarge his sphere of study, and embrace within its circle the German philologists of recent times? Then surely, as some believe and assert, he must be of kindred spirit with the *Neologists*. Does he travel beyond the boundaries of the Westminster Catechism with its commentaries, and wander even beyond the domains of New England or of Hollandic divinity, in order to search after what those men of God have thought and written, who lived at different times, and in other countries; and should he withal maintain that some deference is due also to them? There are not wanting those who will set him down as at heart an Arminian or a Pelagian; nay, there are even some who make no distinction between the creeds of these two classes of men, and who view every departure from the letter of their own creed as downright and reckless heresy.

How can these things be prevented? They are serious evils in their results. In their origin, they are often far from being commendable or even innocent. Haste in making up an opinion without adequate knowledge of

facts; want of kind and candid feeling toward those who may differ from us in their speculations; a proneness to set all truths upon a level as to their importance, whether they are practical or merely speculative; and finally, an assumption of ability to judge of all truth, and rightly to decide respecting it; with now and then an admixture of real bigotry and overbearing demeanour—all these, and some more of the like ingredients may be found in the temper of men, who make such indiscriminate charges as those of which Prof. H. justly complains, and of which, or the like to which, many in other professions besides his, have a similar right to complain.

Whatever ground, however, some may feel that they have to complain of the scepticism of geologists in general, I do not see how any one can attempt to vindicate such a complaint against the author of the articles in question. He has not only avowed in them his belief in revelation, but he has expressly told us, that "so strong is the proof of the authenticity and inspiration of the sacred record, that even if a *point-blank* inconsistency could be made out between it and geology, the latter must yield, because it is not sustained by proof so strong as Revelation."* Let him act in the true spirit of this declaration, and he has nothing to fear from those (and some such there are), whose most earnest occupation is to hunt for heresy and *spargere voces ambiguas*. He might appeal, in the way of self-defence, to the profession of medicine, and ask: 'Has it not been even proverbial, that medical men are sceptics? Yet what profession can boast of more warm-hearted and enlightened Christians than are now embraced, and indeed always have been, among this class of men?'

But enough of this topic. Nothing but the injustice which is so often done by some to individuals, and to whole classes of men, would have induced me to say any thing respecting the subject; and I have only to add, that Prof. H. and other distinguished geologists in our country, and in Great Britain, whom I could easily name,

* Students' Cabinet Library of Useful Tracts, No. XIX. p. 95.

are a standing refutation of the indiscriminate accusations of scepticism which are now and then made against those who are labouring in this department.

I feel it to be proper for me to speak explicitly on this point, lest what I may say in the sequel should be misunderstood and wrongly interpreted by some. My own convictions respecting the exegesis of some passages in Gen. i. differ somewhat widely from those of Prof. H. Far indeed would I keep myself from taxing him with unbelief in the Bible, because he construes some of its contents in a way that differs from my own. Nor am I content merely with being myself thus remote, in this case, from denunciation; I would have this evident also to others, so that no injustice may be done either to him or to my own opinion. Where I see, as in his case I think I do, an unaffected reverence for the authority of God's holy Word; an abiding and deep conviction that it is and must be true, and that its authority is supreme and final; I must have the most decisive evidence of heresy or scepticism before I can suspect a man of the one or the other; and most surely before I can venture to throw out *inuendos* of this nature against him before the public.

Nothing is plainer to me, than that Prof. H. has come to his convictions with great effort of mind and pains-taking in his examinations. The extent of his researches shews this; and the books which he has consulted, and the authorities he has adduced, are sure pledges that he has not gone lightly and rashly and irreverently to work. Yet I am not altogether satisfied with his critical or geological reasoning or results. But I have so much respect for his essays, that I feel bound, after saying thus much, to give the public my reasons for the dissatisfaction which I have expressed.

Prof. H. complains, in several places, that the critics who have defended the usual interpretation of Gen. i. are none of them *geologists*.* They have sat in their closets, and with the knowledge of Hebrew and antiqui-

* See Students' Cabinet Library of Useful Tracts, Nos. II. and XIX.

ties which they possessed, have decided on a matter which can be examined only by traversing field, mountain, and flood; by invading the domains of Neptune, or plunging deep into the regions of Erebus. He would have them, like himself, shoulder the sledge and the knapsack, and march over hill and dale, deep ravine and lofty mountain, now groping in dens and caves of the earth, and now mounting above the clouds of heaven, and hearing the thunders roll, and seeing the lightnings flash far beneath them. In this way he thinks there would be a much more general agreement among philologists, as to the meaning of Gen. i., and that all of them must be united in the belief, that it cannot teach the rise of our world within the last 6000 years.

That such would be the effect of geological pursuits, in the way and manner in which these are now practised, I am not prepared to deny with any good degree of confidence. The gradual settling down upon the grounds of Prof. H., or some such grounds, which seems to be taking place among the great mass of geologists, will serve to shew that his conjectures may not be far from the truth. Yet I have some things to say in respect to the position thus taken, which, as it seems to me, ought not to be overlooked, and cannot safely be neglected.

I am unable to see how the discoveries of modern science and of recent date, can determine the meaning of Moses' words. Nothing can be more certain, than that the sacred writers did not compose their books with modern sciences in view, or indeed with any distinct knowledge of them. My own belief most fully is, that there is indeed nothing in the sacred books, which, when rightly viewed and interpreted according to the established principles of sound hermeneutics, will contradict any of the real and established maxims or principles of recent science. I cannot suppose that God will contradict in one book, what he has taught in another. If he developes himself in the works of nature, as he surely does, then he cannot make an inconsistent and contradictory developement in the volume of his holy Word.

But there are many things adverted to and spoken of

in the Scriptures, which do by no means constitute of themselves a revelation. The sacred writers were not commissioned to teach geology or any of the natural sciences. So often as any of these subjects are adverted to in the Bible, it is altogether in the popular way of speaking. Thus in Gen. i. 7, the *firmament* (רָקִיעַ) is represented as an expanse, as it were solid and extended, which retains the waters above, i. e. those which fall in showers of rain. There can be no good reason for doubt here, that the welkin or apparent arch of the heavens, or the clouds over our heads with the atmosphere, is meant. And in accordance with this, the *windows* or *lattices* (אֲרֻבּוֹת) of heaven are said to have been opened, that the waters to cause the deluge might descend (Gen. vii. 11); and they are in like manner said to be *closed*, when the diluvial rain was restrained, Gen. viii. 2. So in Ps. cxlviii. 4, *the waters which are* ABOVE *the heavens*, i. e. the expanse or firmament, are called upon to praise Jehovah. In accordance with such a popular and *optical* view of the subject, Job speaks of *the pillars of heaven* as trembling or being astonished at the reproof of the Almighty, Job xxvi. 11. On these pillars, it would seem, the patriarch supposed the arch of heaven to rest. In like manner also, the evangelist speaks of *lunatics* being healed by Christ, Matt. iv. 24; xvii. 15. So Paul asks the Galatians, who had *bewitched* them that they should not obey the truth, Gal. iii. 1.

Now in these and all like cases, we are not to assume the fact, that Moses taught or designed to teach the doctrine that the apparent celestial arch above our heads is of solid matter;—nor the evangelist, that the moon has a real and actual influence in creating disease;—nor Paul, that the doctrine of witchcraft is something which is to be truly and philosophically credited. All these things, and others like to them, are referred to merely as things *apparently* existing, or else as *supposed* to exist. Realities, in all cases, are in one sense described by such language,—i. e. something that is real and true; but the *manner* in which these things do actually exist, is not de-

scribed, and, in my apprehension, is not intended to be described. The Bible does not undertake to teach astronomy or physiology as a *science.*

How easy now to vindicate this, and to show that no deceit is practised by the sacred writers! Do not we, after the Newtonian philosophy has so long been spread before the world, and our popular calendars all constructed on its basis—do not we still speak of the sun as *rising* and *setting?* And who is deceived or misled by this popular usage—a usage adopted even by philosophers themselves, because the exigencies of language demand it? Even so with the sacred writers. They could refer to natural objects and phenomena in the popular language of the times in which they wrote. They did so; for on what other ground could they have been understood?

If any one should say, that in proffering these illustrations, I am preparing the way to show that there may be *popular representation* in Gen. i. to which we should apply the science of geology in order to find out its real and true meaning, then, I have merely to remark, that if this principle can be shown to have a proper place there, so far as it goes I would fully admit the application. But that the principle in question cannot be admitted to modify those passages which have respect to the geological difficulties before us, is what I shall endeavour to show in the sequel. I am now concerned merely to show, that modern science not having been respected in the words of Moses, it cannot be the arbiter of what the words mean which are employed by him. Indeed, this proposition is so plain, as to its general nature, that it does not need any confirmation.

That the description of the work of creation, as a whole, contains several things that are said altogether κατ' ὄψιν, i. e. in accordance with things as viewed by the physical eye, I have not the least doubt. The earth, for example, occupies immeasurably the greater proportion of the writer's attention and narrative. Verses 15, 16 describe the creation of the sun, moon, and stars, and all as designed for the service of the earth.

The countless host of heaven occupies but a single clause in the writer's account—*he made also the stars.* As an astronomer, Moses did not surely write. As a *geogonist* he simply appears; and all that does not refer to the earth which he inhabits, is purposely omitted.

In like manner the rise of plants and fruits is described in verses 11, 12, as occasioned by the earth. God commands, and the *earth* brings forth all these things. So in ver. 20, the *waters* bring forth abundantly fish, and fowl, and reptiles, at the command of God. *Optical,* therefore, in some good measure, all this description is. Plants and trees in their origin appeared to spring forth spontaneously from the earth;—fish, fowl, and reptiles appeared to come spontaneously from the water;—and, in accordance with this, the writer represents the earth and water as producing them. Still the voice of the Creator is after all to be heard. *God said,* 'Let this and that produce the objects of creative power.'

I agree in this great truth, with many of the writers on this chapter who have indulged in various phantasies that I must reject,—viz. that the grand object of Gen. i. is to represent to the world the creative power of God, and thus to lead all men to acknowledge and worship him as the maker of heaven and earth. I could almost say, whatever is fully consistent with this, as to interpretation of the details, I would not reject. Yet I dare not go quite this length; for there may be, and there have been, many modes of illustrating the details of creation, or at least designed to illustrate them, which are inconsistent with such details as Moses himself has given. Any thing which I find, after investigation, to be of this character, I cannot receive. Any speculation that leaves untouched the real affirmations which Moses himself makes, I can easily concede that any one should indulge, and this without theological or philological offence. But if the philosopher or the geologist bids me pass by, or wink out of sight, or turn awry, any of the declarations that Moses has actually made as to particulars, then I must beg leave to demur, or to deny the correctness of his theory; or, to say the least, so long as Moses is my guide, I cannot

follow him who sets aside, or, in my view, erroneously, conceives of his true meaning.

In a word, when Professor H.* complains that philologists and theologians do not study geology before they venture to expound the first chapter of Genesis, or that they expound it irrespective of the science of geology, I do not admit that the complaint is well grounded. The question, what Moses meant, is one of *philology*. If you say that geology must be studied as one of the means of rightly understanding so ancient a writer, then I ask simply, Whether this ancient writer's words were modified at all, or in any way affected by the shape or discoveries of the recent sciences? To this question there can be but one answer, and that is in the negative. If, then, Moses knew nothing of present geology, and had no design to teach any thing respecting it, how can we, in expounding his language, bring geology, as it now is, to bear upon our interpretation? So far as I have any knowledge of the laws of exegesis, this cannot be done with any degree of propriety. The circumstances, philosophy, science, opinions in any respect, which attended or belonged to any ancient writer, are all proper and even necessary objects of consideration, when we are endeavouring to explain his words. But if *modern* sciences are to be resorted to in order to explain them—sciences of which he knew nothing, and therefore could teach nothing—then we do not interpret the sense of an ancient writer, we do not make a sense *out* of his words, but (as the Germans express it) we *interpret one into* his words (hineinexegesiren). Shall we undertake to defend or practise such a ὕστερον πρότερον as this, in hermeneutics?

If this will not find sober advocates, (and I think it will not,) then I do not see why we are bound to traverse the earth and dig deep into its bowels, in order to determine what Moses has taught us in Gen. i. Professor Sedgwick has indeed expressed himself on this subject in such a *general* way,† that he may possibly escape ani-

* Students' Cabinet Library of Useful Tracts, No. XIX.

† See Hitchcock, &c.—*Students' Cabinet Library, No. XIX.*

madversion by making out a *particular* meaning, which his readers would not naturally discover. But if I rightly understand the attitude of his mind, (I hope that I do not,) when he wrote the paragraph to which I have now referred, it was that of contempt and ridicule of those who differ from him in the manner of interpreting the Mosaic cosmogony. He speaks of their "making a world after a pattern of their own;"—of their "shifting and shuffling the old strata of the earth, and then dealing them out in such a way as to play the game of an ignorant or dishonest hypothesis;"—of their "shutting their eyes to facts, and denying the evidence of their senses;" —of their "shameful want of knowledge of the fundamental facts they presume to write about;"—of their "dishonouring the literature of their country by *Mosaic Geology* and *Scripture Geology* . . . while they have overlooked the aim and end of Revelation, tortured the book of life out of its proper meaning, and wantonly contrived to bring about a collision between natural phenomena and the Word of God." In this class of men he includes "the Buggs and the Penns—the Nolans and the Formans;" and to this list Professor H. has added Fairholme himself, of whom such an enlightened scholar and fair-minded judge as Sharon Turner speaks in the highest terms of respect.

How far Messrs. Bugg, Penn, and others may deserve a seat in the very humble place that the English Professor has assigned them, I do not know, as I have never read their works; and if I had, I should not feel myself well qualified to judge of their geological offences. But one thing seems to me quite plain, and even to lie on the very face of such a paragraph as that from Professor Sedgwick,—viz. that he assumes for himself a large share of knowledge and of infallibility—of knowledge, not only of geology but of sacred philology—of infallibility, inasmuch as he decides *ex cathedra* upon a subject of immense magnitude and intricacy with a categorical air, and seems to look down contemptuously on all contradiction, or even question of his opinions. He speaks of the Bible as though, in the first place, it is impossible

that it should contradict his views of geology; and, in the second, as though he had so studied and investigated it, as to know for certainty that its representations agree with his own views.

But there is more than one seemingly unequivocal evidence to my mind, that the English Professor has dug as little, and as shallow, for Hebrew roots, as he thinks the Penns, and Nolans, and others have for rocks; and I have yet to inquire, yea I actually despair of learning, how geology can tell us what Moses meant, or settle the interpretation of the Hebrew language. When it can be proved that Moses himself was in the same plight as a modern geologist, and that he meant to teach something respecting their favourite science, then we may begin the consideration of this subject anew.

Indeed philologists have fair ground of strong complaint against many of the geologists in regard to the matter under consideration. They would be entitled to ask, Where, among them all, is one profound critic and interpreter of the Scriptures, or where has there ever been one? This is a question, too, which is somewhat radical in a business like our present one. Our inquiry is, What does the *language* of Moses mean? We propose to solve this question simply by *philology*. They tell us we must not so construe Moses as to contradict their *geology;* and that geology must be called in as the final umpire, where doubt and dispute may arise. We make the appeal from such a court, and say the cause is *coram non judice*. They remonstrate, because they will not be contradicted. They are sure that their decision of a scientific nature about the age of the earth must be well grounded. As philologists we say—Be that so or not, it is nothing to the question what the record of Moses means. If they please, let it be a question, whether Moses has taught wrongly or rightly; but it never can be a question with philologists, whether modern science is to be the final judge of what an ancient writing means. That is as settled as the first principles of interpretation, and as the first laws of reason and the human mind in relation to this subject. After all due allowance for the

manner in which a writer has communicated his thoughts, the costume he has put upon them, and the design which he had in view, the common principles of interpreting words must be carried through and through. The speculatist may start back,—the bigot may remonstrate, and say that his creed will be overthrown,—the geologist may cry out against it, and aver that science must decide what the Bible can mean; but with all this the philologist, as such, has nothing to do. One simple thing is his business, and this is merely to seek, by the aid of usual, well known, and established principles of interpretation, after what his author has said or declared. This done, his work is at an end. To attack the *sentiment* thus educed, is indeed within the power of geologists, and of others also; but to show that the sentiment of the author is not what philology has educed from his words, is a different thing from examining rocks or assaying ores.

I hope that my suggestions will not be misunderstood. No design of attacking geologists is couched under them. I have taken occasion from what some of them have said to give my views of the true state of this question, and to show where the ultimate appeal must be, when we come to ask, What does the record of Moses mean? If I have satisfied the reader that *philology* (rather than geology) must investigate and judge of this, then we are prepared to consider such philological investigation as the sequel may exhibit.

Professor H. suggests,* that Gen. i. has ever been a *locus vexatissimus* to the critics. But when he intimates, here and repeatedly elsewhere, that it has been so *independently of geology*, he is surely mistaken as to the substance of his opinion. He tells us that the *older* critics differ endlessly about the meaning of Gen. i.; and this was before the science of geology existed. But in reply to this, we may obviously say, that something thought to be geology, or geogony, has existed from the earliest ages of philosophy. It is necessary to do nothing more than simply to mention the names of Plato, Aristotle, and

* See Students' Cabinet Library of Useful Tracts, No. XIX.

Lucretius, in order to recal to the mind of a well-informed reader what speculations have been indulged in regard to the formation of the earth. In all ages this has been a great and perplexing problem. The old commentators had their full share in this perplexity. Hence we see that all their theories, almost without exception, are built on the *nature of things* as viewed by them, and not simply on the meaning of words as employed by Moses. I do not intend to assert that there have been no diversities of opinion which are of a philological nature, respecting any portion of the first chapter of Genesis; but I am warranted in saying that there has been as little diversity here, as respecting any other part of the Old or New Testament, except what has been occasioned by the speculations of naturalists and geogonists. Indeed, I scarcely know of any part of the Scriptures which affords less room for philological differences of opinion, than the words of Moses in Gen. i.

But it is time for *proof* rather than assertion; and to the proof let us go, in regard to those passages on which our whole controversy with some geologists rests.

One great problem has been to know what is the meaning of בָּרָא in Gen. i. 1.

Our English translation gives the meaning of the word by employing the verb *create*. The translators, doubtless, meant by this to designate the idea that God in the beginning, or first of all, *brought into existence*, by his sovereign and creative power, the elements of which the heavens and the earth are composed. Were they in the right when they so rendered the word?

I cannot entertain a doubt that they were. I do not argue this merely from the etymological force or meaning of the verb בָּרָא, nor yet from any uniform *usus loquendi* in respect to this word. Like the word *create* in English, or *creo* in Latin, or ποιέω in Greek, it may mean to *form, mould, fashion, give birth to* or *bring into existence*, in any way, or by the use of any instrumental causes;—also *to occasion, to establish, to constitute, to make*, in such a sense as to arrange things, so as that a

particular object should exist or occurrence should take place; and other significations it may have of a nearly allied nature. Thus we say in English: 'God *created* all things out of nothing; he *created* man, viz. made him out of the dust of the earth;—God *creates* Jerusalem a rejoicing, i. e. he makes or constitutes her joyful;—God makes peace and *creates* evil, i. e. he is the author of, or occasions, or brings about happiness and misery;'—and thus in a multitude of cases. We say of a king: 'He creates many offices or officers, i. e. he constitutes, or appoints, or establishes many.' We say of a seditious man: 'He created great disturbance, i. e. occasioned it or excited it.' And all this, or nearly all this, variety of signification belongs plainly to the Hebrew verb בָּרָא.

The cases are somewhat numerous and quite plain, where it is employed as parallel or synonymous with the verbs עָשָׂה *to make*, and יָצַר *to form* or *fashion*. Of this the reader may assure himself by looking at the Hebrew original in Gen. i. 26, (נַעֲשֶׂה,) comp. with i. 27 (בָּרָא); and so in Gen. v. 1; Isa. xlv. 12; xli. 20; Isa. xlv. 18, (par. with יָצַר); xliii. 7.

The passages in which בָּרָא seems plainly to mean *create*, in the highest sense of this word, are the following,—viz. Gen. ii. 3, ... all his works, which God *created for making*, בָּרָא . . . לַעֲשׂוֹת. So the original runs; and the idea seems to have been very imperfectly understood by most interpreters. Even Rosenmüller makes the signification of לַעֲשׂוֹת out, by translating it *elaborando*, q. d. God created the world, by *laboriously operating* upon it. How little this consists with the Mosaic record, which every where presents us with a *God said, Let there be, and there was;* or as the Psalmist sublimely and beautifully expresses it, "He spake and it was done, he commanded and it stood fast"

—how little congruity with all this there is in even Rosenmüller's interpretation, readers of taste can scarcely fail to discern. The plain and obvious meaning, to my own mind, is—*which God created by making*, or *in respect to making*. The writer means to aver; that God *rested from all his works*, which, after he had created the material, he had performed in moulding and fashioning it. What constitutes the peculiar critical value of this passage is, that a distinction between the meaning of בָּרָא and עָשָׂה, when thus employed together in relation to the subject of creation, is clearly indicated. That distinction is again kept up in Gen. ii. 4, where the *creation* (בְּהִבָּרְאָם) of the heavens and the earth seems to be distinguished from the *making* (עֲשׂוֹת), i. e. forming or fashioning the various things which adorned the world after it was brought into being.

In Num. xvi. 30, is a passage which forcibly illustrates the higher sense of the verb בָּרָא. "If God בְּרִיאָה יִבְרָא, lit. *should create a creation*, and the earth should open her mouth and swallow them up," viz. Korah and his company. There the idea most evidently is, 'If God should bring about or accomplish a thing altogether new and unheard of.' This casts light on the force of the verb בָּרָא, as used to designate an original act of creation.

In the sense of *creating from nothing*, the verb in question seems to be plainly employed in Ps. cxlviii. 5, "Let [the heavens] praise the name of Jehovah, for he commanded, and *they were created*." So in Isa. xl. 26, "Who hath *created* these things?" viz. the heavens. Isa. xlii. 5, "Jehovah, the *creator* (בּוֹרֵא) of the heavens." Isa. xlv. 7, "He who *creates* darkness," referring, no doubt, to Gen. i. 2—5. Isa. xlv. 18, "Jehovah, the *creator* of the heavens." Isa. lxv. 17, 18, "Behold! I *create* new heavens and a new earth . . . rejoice for ever in that which I *create*." Here the epithets *new* not only

intimate that God created the heavens and the earth in former times, but that, by a like power, he will again cause a heaven and an earth to be, which did not before exist.

Usus loquendi, then, leaves us no room to doubt that the verb בָּרָא *may* have such a meaning as has been given to it. If there is any place now in all the Bible where such a meaning is demanded, it is surely Gen. i. 1; for if the heavens and the earth were not *created* in the BEGINNING, what was the beginning antecedently to this? If any one should say with Plato and Aristotle—The world, as to its *materials*, was eternal. My answer is—Then there was no *beginning*. But Moses believed and taught that there was a beginning.

One thing more may be said, which is, that if the verb בָּרָא does not mean to *create* in the highest sense, then the Hebrews had no word by which they could designate this idea. This is not only improbable, but directly contrary to the opinion of Paul, who tells us, (Heb. xi. 3,) that "the worlds were framed by the Word of God; so that things which are seen were *not* made of things which do appear," i. e. they were made out of nothing. This settles the controversy, if any there may be, what בָּרָא must mean in Gen. i. 1.

As to other shades of meaning in respect to this word, the reader may find them in Gen. i. 27, where *formation* from materials already existing is designated. So in Gen. v. 1, 2, 4; vi. 7; and probably in i. 21; also in Deut. iv. 32; Ps. lxxxix. 47 (48); Ps. cii. 18 (19); Ps. civ. 30; Eccl. xii. 1; Isa. xl. 28; xliii. 1, 7, 15; xlv. 12, 18 (perhaps so in the second case in which the word is used); liv. 16; Ezek. xxi. 30 (35); xxviii. 13; Mal. ii. 10.

Other examples occur in which the sense is, *to cause, occasion, bring about, constitute*, &c. without particularly marking the manner of effecting this: Exod. xxxiv. 10, (נִבְרָאוּ *done, accomplished;)* Ps. li. 10 (11); Ps. lxxxix. 12 (13), *constituted;* Isa. iv. 5; xli. 20; xlv. 7, 118

(in the second case); xlv. 8; xlviii. 7; lvii. 19; lxv. 18, (in the second instance); Jer. xxxi. 22.

I remark, in addition to this, that the verb in Piel has another and different sense, viz. *to cut, cut down, hew out*, e. g. Josh. xvii. 15, 18; Ezek. xxiii. 27; xxi. 24. But this form of the verb Buxtorf derives from בָּרַר; and the origin may be a matter of doubt, inasmuch as the Arabic has both the roots ברא and ברר.

These, I believe, are all the cases in which בָּרָא is employed in the Hebrew Scriptures; and from these nothing can be derived to favour the hypothesis of some geologists, that the matter of the earth is *eternal*. Paul has interpreted the passage for us; and if he had not, the nature of the narration in Gen. i. would do it, so as to leave no well-grounded doubt. Only look for a moment on the course of thought in the writer. After the heavens and the earth were *created*, the earth was still a *waste* and *desolation* (תֹּהוּ וָבֹהוּ), i. e. all the furniture which was afterwards supplied—all the forms of animated and organic being, the divisions of land and water, and even the existence of light, as yet were unknown or had no being. If God did not *bring into existence*, then, the heavens and the earth at the beginning, what did he do?

Thus we have the first great event or transaction in the formation of the universe. It consisted *in bringing the materials into being*. Professor H., indeed, appears fully to accord with me here, so that he and I have no controversy on this subject. But there are geologists who doubt all this, or look very grave when it is suggested, and think that it belongs only to superstition and credulity to give credit to it. I once met with a philosophizing Jew, who strenuously maintained that בָּרָא means only *to array, adorn, set in order* &c.; and when I asked him how the earth when *adorned* and *set in order* could still be *desolate* and *waste*, as Gen. i. 2 asserts, his reply was, that Moses ought to have put the

second verse first. This may provoke a smile from some; but grave geologists are not wanting, who reason little, if any more conclusively than this, so far as the record of Moses is concerned.

Having disposed of the word בָּרָא, nothing more remains, as to the first verse, than to remark, that *the heavens and the earth* is Hebrew phraseology to designate the *universe*,—the τὸ πᾶν of Plato and Aristotle,—and the *whole creation*, as this phrase is familiarly employed by us. This is evident from the general *usus loquendi*, and abundantly so from the sequel in Gen. i.

As to Father Simon's assertion, that "the signification of Hebrew words is *entirely uncertain*, and that there is always ground to doubt whether the sense which any translator gives to them is the true one,"*—one hardly knows which to wonder at most, the hypocrisy of the writer and his servile cowering to the right claimed by the Pope to determine the sense of Scripture, or the unparalleled effrontery and impudence which he has shown towards philology.

Let us come now to the second verse, on which Professor H. appears to rely as the main support of his whole system, so far as it respects a conciliation of it with the Scriptures. The object which takes the lead in our consideration should of course be the *philology*.

Our first attention seems to be claimed by the particle וְ, which stands at the beginning of Gen. i. 2. Professor H. says, "It is quite clear that the first verse, at least, may be regarded as *independent* of the other six day."† Accordingly, he views the transaction recorded in it as entirely separate from the six days' work;‡ and not only so, but he avers that "sound criticism will probably allow us to go farther, and to regard the second verse of Genesis as a description of the condition of the earth, *previous to the commencement of the six demiurgic days*."

* Students' Cabinet Library of Useful Tracts, No. XIX.
† Ib. No. XIX. ‡ Ib. No. XIX.

But how is this to be made out? The second verse is connected with the first here by the particle or conjunction ו, which looks very much like an indication that the narration is simply continued, and that the whole belongs to one and the same period. But the Professor quotes a passage from Penn's Geology, which avers "that ו discharges the functions of all the conjunctions, both copulative and disjunctive." The Hebrew philologist will smile at least as broadly at this *criticism* in Mr. Penn, as Professors H. and Sedgwick do at Mr. Penn's *geology*. The conjunction ו discharging all the functions of both the copulative and disjunctive conjunctions in the Hebrew language! Are there any of the megalosauri, iguanodons, or mastodons of the new geology, that exceed the magnitude of such a conjunction? *Vav* has often been called a *Proteus* before, by many who found it difficult to trace out and recognize all its features; but never before was I aware that this Proteus had become so large as to cover more ground than Typhoëus of old. "But Michaelis," we are told, "gives it 37 different significations, and Noldius upwards of 70." Be it so: any one who knows fully the fashion of Michaelis' philology will wonder that he stopped short of twice that number; and as for Noldius, this is quite a matter of moderation in him. Good Father Schleusner has, in like manner, no less than 32 meanings for *καί*, the corresponding Greek particle in the New Testament, besides another head of "haud raro abundat," and another of "interdum deficit." Mr. Penn therefore does not stand quite alone in his philology. Examples of such unbounded license in making out meanings for words, and such undistinguishing descriptions of the use of words, may be found in many of the older critics, as often and as easily as the art of making gold among the old alchymists, or composing spells to drive away evil spirits among the enchanters; and, by the by, they are entitled to about as much credit.

Vav supplying the place of all the conjunctives and

disjunctives of the Hebrew language! A singular people, indeed, the Jews must have been, to have coined so many other words as they have done, in order to designate the different lights and shades of these classes of words. The bygone days of criticism might not have been astonished at such an assertion as that of Mr. Penn; but the present time will look on it as Professor Sedgwick does upon his geological knowledge.

Nor does the appeal to Rosenmüller's authority convince us any better, who, it would seem, translates it by a word equivalent to the English *afterwards*. But who is the Rosenmüller in question? Not (as Prof. H. seems here and throughout his essays to have supposed) Rosenmüller the *Son*, the recent and eminent Hebraist and critic, but Rosenmüller the *Father*, who wrote easy, flowing, moderate, although useful notes on the New Testament, and speculated on *Antiquissima Telluris Historia*,—a scholar in *Hebrew*, I may add, from whom *posteaquam*, as a translation of וְ, would not be unexpected.

One thing, however, can be said with truth respecting Gen. i. 2, viz. that of course it relates what took place in the order of time *after* the act of creation related in the first verse. The general sense of the verse would not be materially injured by translating it thus: *Afterwards the earth was without form, &c.* But to make out such a sense from וְ, which here is simply the sign of connection between the first and second verse, would be no small departure from the plain and obvious principles of Hebrew grammar and lexicography.

Beyond all doubt, the earth must first exist as to its constituent materials, before a *waste* and *desolate* condition of it could exist. Gen. i. 1 asserts the first, Gen. i. 2 the second. But what is the *waste* and *desolate* condition described by the תֹּהוּ וָבֹהוּ of the Hebrew?

The word תֹּהוּ is by no means an unfrequent one, and seems to be so plain as to its meaning, and withal so uniform, as scarcely to admit of a doubt concerning it.

It comes from the obsolete root תָּהָה, Chald. תְּהָא, which signifies *to be waste* or *desert* (vastus, desertus fuit.) The Arabic also has تَهِيَ, *vacuus, empty.* Hence, in all the cases where it appears in the Hebrew Bible, it designates *waste, desert, inanity*, i. e. something which is entirely void of any fruit, production, ornament, furniture, buildings, &c. according to the nature of the thing to which it is applied. Thus, when predicated of a city, it designates the destruction or ruinous state of it, e. g. Isa. xxiv. 10, *city of* תֹּהוּ, i. e. of waste, i. q. *wasted* or *desolated city.* It is applied to empty space, e. g. Job xxiv. 7, "He stretches out the north over תֹּהוּ," i. e. empty space. It designates the *nothingness* or *nihility* of idols, e. g. 1 Sam. xii. 21 (bis.) It is applied also to the makers of idols in Isa. xliv. 9. It designates mere *nihility*, in Isa. xl. 17 (parallel with אַיִן and אֶפֶס); and so in Isa. xl. 23; xli. 29; xxix. 21; xlix. 4. It is applied also to a pathless desert, destitute of all vegetation, water, &c., e. g. Job vi. 18; Deut. xxxii. 10; Job xii. 4; Ps. cvii. 40. It also means *frustra*, i. e. in vain, for nothing, for no cause or reason, e. g. Isa. xlv. 18, 19.

These are all the cases where תֹּהוּ is employed in the Hebrew Scriptures, except when it is joined with בֹּהוּ, as in Gen. i. 2. In such a case, the two words united express, in a most intense manner, the idea of a *desolate* and *waste* condition. The word בֹּהוּ comes from a root that is obsolete in Hebrew, viz. בָּהָה; but the Arabic بَهِيَ (בהי) has preserved the root, and this has the sense of *vacuus et inanis fuit*, which is almost the same that תָּהָה (the root of תֹּהוּ) means. In this way it is made plain, that בֹּהוּ means *emptiness, inanity.* It is used but three times in the Bible, and then always as joined with תֹּהוּ, in order to make out an intense expression, by thus uniting two words together

that are synonymous, or nearly so. Thus in Isa. xxxiv. 11, it is said of Idumea, that "the line of תֹּהוּ [waste] shall be stretched over it, and the stones of תֹּהוּ," i. e. the plummet of emptiness. The prophet thus represents Idumea as measured out with line and plummet for total and entire destruction. So in Jer. iv. 24, "I beheld the earth, and lo! it was תֹּהוּ וָבֹהוּ," i. e. like its original, chaotic, waste, and desolate condition. So the sequel shows. 'He beheld no man,—the birds of heaven were all fled,—the fruitful place was a wilderness,—the cities were laid waste,—and the Lord said, The whole land shall be desolate.'

If now there are any words in the Hebrew language which are capable of expressing a state completely waste and void, desolate as to any production, ornament, fruit, buildings, inhabitants, organized or animated beings, &c. the words תֹּהוּ וָבֹהוּ are the very ones. It was impossible that Moses should have described more strongly the chaotic and desolate state that followed the original creation, and preceded the forming and fashioning of the elementary matter in various ways, and the filling of the earth with organized and animated beings.

It is in vain to contend against this view of the subject. Not only the language itself confirms it, but all the sequel of the narrative does the same. Professor H. tells us,* that "all the elementary principles of matter already existed and were at work, and that this chaos was not an absolute and real one, but only a comparative one." Yet after allowing that some of the chemical affinities may have existed, and gravitation (for ought we know) may have been at work; yet there was no *light* nor *heat*, for the אוֹר, which God created on the first day, seems to designate both these; and, in fact, they are almost inseparably connected together in nature. What then could a world without light or heat, without sun or moon, without dry land and without any principle as yet of actual pro-

* Students' Cabinet Library of Useful Tracts, No. XIX.

ductiveness—what could such a world do towards furnishing the unnumbered myriads of organized and animated beings, which geologists find, or suppose they find, in the second and tertiary rocks and strata? This question is absolutely and finally decisive of the whole matter, unless we can show that this chaotic state was merely that which succeeded some catastrophe of our world, and preceded the fitting it up for its *present* races of inhabitants.

Nothing can be more destitute of any *scriptural* basis, however, than such a theory as this. Geologists tell us, that some two, three, or four (for they are not agreed how many), catastrophies came upon our world, before the diluvian one in the time of Noah, of which Moses has taken such special notice. At one time the world must have been burst all in pieces, as it were, and blown up by volcanic processes in its interior, which broke up in unnumbered localities, the strata of rocks that had been deposited over the surface of the globe by some preceding cataclysms, protruded some of these on the top of others, lifted up some masses at all possible angles of elevation, and hoisted up others on the top of the masses heaved up from beneath. Besides all this destruction or breaking up of the regular strata formed by diluvial deposit, the volcanic explosions heaved up the everlasting mountains, the primitive rocks formed in the depths of the ocean by more than Volcanic forges, and smelted in furnaces that reached from the arctic circle to Cape Horn, and from Cilicia in Asia Minor to the Pacific Ocean that washes the eastern shores of the "celestial empire." Volcanoes that could heave up the Alleghany and the Andes, the Taurus and Caucasus ridges, and the Himmala group, with others of like character, must have been serious ones indeed.

But not to approach the less grave; I have to ask, how, in the midst of all these successive catastrophies of the earth, it fared with the *celestial* worlds, the sun, and moon, and stars? Were they also blown up, or covered with profound and terrific cataclysms? It may be so; but not a word of all this is to be found in the Bible. Nay, so far are we from such a supposition on the part of him who wrote Gen. i., that he represents the sun, moon,

and stars, as coming into existence as *luminaries*, only on the *fourth* day of the creation. Prof. H. thinks that the sacred writer speaks (in Gen. i. 14—18), merely of "assigning to the heavenly bodies their offices on that day;" and Hensler, the German speculator on this subject, supposes, that the sun, and moon, and stars were all made on the first day, but that the fog and mist from the earth, which had newly emerged from the ocean, were so intense, that none of them came to shine out clearly, earlier than the fourth day. *

* Bishop Patrick's theory was that of an elemental chaos; and at the beginning of his commentary he argues for such a chaos, between the first production of which, and the creation of light, he imagines an indefinite period. He then supposes a work of six days.

Rosenmüller again, the German commentator and critic, conceives a previous earth, or a first production, and a subsequent renovation.

The chief difficulty in the way of this supposition, is the work of the fourth day, of which, by our translation, it is said—"Let there be lights in the firmament of the heaven to divide the day from the night; and let them be for signs, and for seasons, and for days, and years: and let them be for lights in the firmament of the heaven to give light upon the earth: and it was so. And God made two great lights; the greater light to rule the day, and the lesser light to rule the night: he made the stars also. And God set them in the firmament of the heaven to give light upon the earth, and to rule over the day, and over the night, and to divide the light from the darkness: and God saw that it was good. And the evening and the morning were the fourth day."

Even Granville Penn contributes some help to the solution of this difficulty, when he tells us that the description in the first chapter of Genesis proceeds not in the order of the creation actually, but in its order optically.

But the most complete solution of this difficulty of which we know, has been furnished by Rosenmuller. On the fourth day he says, that "if any one who is conversant with the genius of the Hebrew, and free from any previous bias of his judgment, will read the words of this article in their natural connection; he will immediately perceive that they import a direction or determination of the heavenly bodies to certain uses which they were to supply to the earth. The words יהיו מאורת (in the 14th verse) are not to be separated from the rest, or to be rendered 'fiant luminaria,' let there be lights—that is, 'let lights be made;' but rather 'let lights be,' —that is, 'serve in the expanse of heaven'—'inserviant in expanso

Of all this, however, Moses has given no intimation. His narrative, as it seems to me, does not admit of such an interpretation. The whole matter, as it lies before us in the record, is very simple, In the beginning, i. e. first of all, or that which commenced the process of creation, was the bringing into existence the material elements, out of which, the heavens and the earth were afterwards constructed and adorned. Then followed the chaotic state, at least of the earth's elements; and can we doubt that the same was the case with the elements of the heavenly bodies too? inasmuch as it was not until the fourth day that they were arranged, and reduced to order, and applied to their uses. It was with them as with the earth; the chaotic preceded the arranged and well-or-

cœlorum'— for distinguishing between day and night, and let them be, or serve for signs, and for seasons, and for days and years. For we are to observe that the verb היה to be in construction with the prefix ל 'for,' is generally employed to express the direction or determination of a thing to an end, and not the production of the thing—for example, Numbers x. 31; Zechariah viii. 19, and in many other places."

He further argues thus—"But the difference between the singular יהי and the plural יהיו in the 14th verse, demands a corresponding difference in the interpretation; and, therefore, if we would make that difference literally apparent, we must thus literally interpret—'Fiat, luminaria in firmamento cœli ad dividendum inter diem et noctem, ut sint, in signa, et tempora, et in dies, et in annos, et sint ad illuminandum super terram.' That is 'Fiat ut luminaria sint in signa &c. et ad illuminandum &c.' The particle ו signifies 'ut' in three hundred passages, and והיו signifies 'ut sint' in several of them. This interpretation therefore yields this literal sense in our language—'Let it be, that the lights in the firmament of heaven, for dividing between the day and the night, be for signs, and for seasons, and for days, and years.'—that is finally—'Let the lights in the firmament of heaven, for dividing between the day and night, be for signs, and for seasons, and for days and years; and let them be for lights in the firmament of the heaven, to give light upon the earth; and it was so:' so that Rosenmüller's induction from the construction of this passage is, 'de determinatione astrorum ad certos quosdam usus orbi terrarum præstandis, esse sermonem—non de productione'—or that the narrative in these verses respects the determination of the heavenly bodies to the performance of some certain uses to the earth—not to the production of these bodies."

dered condition. On the first day, i. e. the beginning of the first part of the light-season, the element of *light*, and no doubt of *heat* (for אוֹר means *light* and *heat*), was created. The God of nature has so united these, that heat can scarcely ever be fully developed without manifesting that light attends it; or light scarcely ever developed, unless attended by heat. These two principles, moreover, are now well known to enter into the composition (I believe we may almost confidently say) of all, or nearly all bodies. They are each known to exist in a *latent* state. That light is latent, is as well capable of demonstration as that heat is latent. All the powers of matter, all its properties and affinities, are beyond a question modified by the presence of light or heat, in the developed or the latent state. Electricity, galvanic power, magnetic action, are all probably modifications of the action of these elements, or, at any rate, these are intimately connected with them. To what an extent chemical affinities may depend on their separate, combined, or modified action, it is beyond the bounds of human reason in the present state of the sciences to determine.

If the reader has any difficulty in conceiving how light could exist or be created, before the sun and stars were arranged in their present order, it must be only because he is unacquainted with the present state of science in regard to this element. Even before the time of Newton, the famous Des Cartes suggested that light might be a subtle fluid diffused through the universe, which was acted upon and rendered palpable by the presence of the sun, when above the horizon, rather than flowed from that body. In Newton's lifetime, Dr. Hooke and Huygens urged the theory of Des Cartes. Euler again revived it. Dr. Young adopted it, with very scientific illustrations; and since his time, Dufresnel, A. L. Cauchy, M. Pouillet, Sharon Turner, and many others, with some slight modifications, have embraced and defended it. It bids fair soon to become the general belief of philosophers. Yet, certain as it is that there is latent light in every part of matter, and much light that never can be said to proceed from the sun, yet that his beams have a

cheering, warming, quickening, and life-giving influence, there can be no doubt. The presence of the sun is necessary to vegetation, and to animal vigour, if not life. It matters not whether the light that appears to flow from the sun actually radiates from him, or whether his presence above the horizon occasions all the present phenomena of light. Philosophers may dispute about this; but the beneficence of God is altogether conspicuous in providing for our world a sun, whether he radiates light, or otherwise causes a development of it. One other thing is equally plain and true, as facts now abundantly show,—viz. that light and heat in a latent state, and in some cases in a developed state, exist in all parts of our world, and doubtless of other worlds, *separately from any present proveable or even probable influence of the sun.* The reader who wishes for a popular, but still an able, lucid, and satisfactory account of this, may read the *third* letter in Turner's Sacred History, Vol. I.

It has been disputed whether light and heat are *material* substances; but as they can be absorbed, refracted, reflected, and radiated, if they are not material, they are at least modifications of what is material—they possess attributes which are kindred to those of matter. But the discussion of this is not important to our present purpose. It is sufficient to remark, that light and heat seem to be a kind of *anima mundi*, when considered in a philosophical point of view. They are so tenuous and subtle, as to leave the question doubtful whether they are actually to be classed with material substances; yet do they, or at least one of them, belong more or less to the composition of all material bodies; and with all this subtilty, this spirituality (as it were), they are agents that can be employed so as to change the face of heaven and earth, and complete almost all the processes by which the laws of nature are carried into execution. Had Plato understood this subject, he might have written of the ψυχὴ κόσμου much more significantly and intelligibly than he has now done.

Is it mere imagination in me, when I say, that the account of the world's formation bears an analogy to the

account of the creation of man? God first formed his body out of the dust of the ground, then he breathed into the lifeless mass the breath of life, and man became a living soul. And the like to this happened as to the material world at large, or (in all probability) the material universe. In the beginning God created the grosser substance of which the worlds celestial and material consist. Then to this chaotic, and as it were inanimate and unproductive mass, he added *light* and *heat*, the soul as it were of the material universe. The Spirit of God which moved upon the waters, i. e. brooded over them as it were (מְרַחֶפֶת *incubated*), did not move in vain. He prepared them for the great event that was to follow—the creation of light and heat. These new guests were to be received and welcomed by the chaotic mass, on which darkness more than Egyptian had rested, and where wild disorder and desolation reigned. God said, *Let there be light*, and all was cheerful, and peaceful, and reduced to order. Then follow, in natural succession, the perfecting of the work thus begun. All was now in readiness to proceed. The atmosphere is created on the second day, for this was necessary to animal and vegetable life. The dry land is next called forth, and covered with herbs and fruit trees. Vegetables are thus provided for animals before they are formed. The celestial firmament, orderly and stated light and heat as occasioned by the heavenly bodies, come next, in order to prepare for the growth and maturity of fruits and plants. If the reader is disposed to ask, Why were not the heavenly luminaries made before the creation of the plants and fruit trees? It may be difficult to answer the question, why the Creator preferred this arrangement to the other; and we need not undertake to do so. It is enough to say, that light and heat already existed; for these had been created the *first* day. Plants did not, according to the first arrangement of all, absolutely need *solar* light. But even if we put this entirely out of account, it will be seen that the very next day after the creation of the herbal and the dendral world, the luminaries of the skies

were pouring their beams down upon them. Thus there was a specific natural object to be accomplished by the Creator, by that which took place on the fourth day.

'But why *sun*, *moon*, and *stars?* If light and heat, day and night, already existed, or had existed, then were they provided for; and the sun and all the celestial bodies might be dispensed with, so far as it respects the earth. Light and heat might exist without them; and day and night were as regular before the sun shone, if Moses is to be credited, as they were after he appeared in his full strength and in his apparent diurnal revolutions.'

So may many of my readers naturally exclaim; and I must try to remove their difficulties before I proceed in the remarks I was about to make. Many of them, possibly, have been not a little perplexed, even to divine how there could have been three *days* and *nights* before the heavenly luminaries were arranged.

The removal of doubts on this subject seems now to be less difficult than formerly, when the nature of light and heat, and the phenomena of the heavens, were much less understood than at present. That light could exist, and did exist, and does exist, independently of the sun, we can no longer doubt. Who does not know that astronomers have not only discovered luminous regions in the heavens, but that some of these have been observed to be gradually contracting themselves, and growing as it were into fixed stars, *i. e.* suns, perhaps, of other systems of worlds. Even the comets that belong to our solar system seem to be undergoing contraction and solidification. One of the comets whose course is limited within the orbit of Jupiter, as calculated by Encke, seems to be without any nucleus, or any regular or well defined form. Stars are seen through it,—its figure is somewhat circular, and it has no tail. Can he, who even now continues thus to dispose of the celestial luminaries and light, have been wanting in power, when he was putting forth his highest and all-creative and dispositive energies to make day and night to the earth without the aid of the present celestial luminaries? Even if the exertion of his special power in making alternations of light and darkness be

doubted or denied, what hinders us from supposing that, from the very first, the earth had its diurnal motion around its axis, and that luminous celestial phenomena, like those which astronomy now discovers, imparted to it the light of the first three days? He who can doubt this, or find any serious difficulty in it, must, to be consistent with himself, doubt whether God could say, *Let light be*, and light spring into existence. Amid a world of astounding wonders, like those of the creation, why should we be stumbled at a small exertion of divine power and skill, analogous even to what astronomers now see with telescopic vision, if not with the naked eye?

Enough for this. 'But why must the sun, and moon, and stars be introduced at all?' Not, I answer, in order simply to make day and night. Other purposes were to be subserved by them. These were also "to mark seasons, and times, and years," Gen. vi. 14. The constitution of these as *luminaries* in their respective orbits and places, was a new thing, a new arrangement of the Maker of heaven and earth. Light existed before; but *luminaries*, with regular circles of movement which would measure times and seasons, did not yet exist. That the orbicular motion of the heavenly bodies existed from the day in which their gross material was created, *i. e.* from the first day or the beginning, has been sometimes assumed; but it cannot be proved, nor does it seem to be very probable, so far as the Mosaic account is concerned. At any rate, the revolution of the heavenly bodies through space, as *luminaries*, did not exist until the fourth day.

Whether the light that shone from above upon the earth, during the three first days of creation, was contracted, and then united with the sun and other celestial bodies, is a question that cannot be determined by philosophy or philology. It seems quite probable that such was the case. When God is spoken of as *making* the heavenly luminaries, Moses does not say בָּרָא, he says וַיַּעַשׂ, (Gen. i. 16.) This last word is generally and habitually employed in Gen. i. to designate the *secondary*

act of creating, if I may so speak, in distinction from the first or original one.

Professor H. has quoted Hensler, Penn, and Rosenmüller [the father], in order to show that the Hebrew of Gen. i. 14, seq. may be, and should be translated, *Let lights be for distinguishing day and night*, &c. The object of this criticism is to show that the sun and other heavenly bodies may have existed from the very first as luminous bodies; but that now, i. e. on the fourth day, a new office was assigned to them, viz. that of distinguishing between day and night, between times, and seasons, and years.

My first answer to all this is, that Professor H. himself supposes all matter from the very first to have been endowed with the same qualities which it now possesses; and that all the processes in nature, connected with the development of these qualities, immediately commenced their operation.* Of course, then, the sun not only caused the three first days, but it was just as much in the way of making "the seasons, and times, and years," as it was after the fourth day's work was finished. What was accomplished on the fourth day, therefore, by the Maker of heaven and earth, I am unable to see, if the ground which he takes is stable.

But I have other reasons for rejecting this interpretation. The Hebrew יְהִי מְאֹרֹת, *Let luminaries be*, i. e. exist, can no more be rightly interpreted as Hensler, the elder Rosenmüller, and others interpret it, than יְהִי אוֹר, *Let there be light*, can be interpreted in the like way. The one is the same as the other, to all intents and purposes. The object of the writer is evidently the same. The context shews this beyond any rational doubt. In the first part of v. 14 God says, *Let there be luminaries;* in the last part of the very same verse he says, (designating the purposes for which they were so constituted), *Let them be* FOR *luminaries* (לִמְאֹרֹת, not as in

* See Students' Cabinet Library of Useful Tracts, No. XIX.

the first part of the verse (מְאוֹרֹת), *in the firmament of heaven, to give light upon the earth, &c.* Now what else would this last declaration be, if the critics above named are in the right, but a simple *agere actum*, the saying over again, *totidem verbis*, what had the moment before been said?

But there are other reasons against the proposed interpretation, in the sequel. Ver. 16 and 17 tell us first of the *making*, then of the disposal of the luminaries in question. First, God *made* them, וַיַּעַשׂ; and he made them *in order to rule the day, &c.* Then, secondly, "God *placed them* (וַיִּתֵּן) in the firmament of heaven, in order to give light," &c. Here are two distinct, separate, and sequential actions, the making the luminaries, and then the disposing of them so as to fulfil the purposes for which they were made. The writer has rendered his meaning so plain, that we have no room to doubt.

It needs, indeed, a nice perception of the laws of Hebrew idiom, in order to distinguish the first יְהִי מְאוֹרֹת, *let there be luminaries*, and the second וְהָיוּ לִמְאוֹרֹת, *and let them be for lights.* But to one who does know the niceties of Hebrew idiom, nothing is plainer than the distinction. In the first, מְאוֹרֹת, יְהִי, there is the apocopate Future of the verb הָיָה *(to be)*, used in an Imperative way; and (what is specially to be noticed) used in the *singular* number, although the noun that follows (מְאוֹרֹת) is of the plural number. This idiom resembles the French, *il y a des hommes*, or *qu' il y ait des lumieres*, or the English, *let there be luminaries*; although the latter language does not distinguish the verb *be* as of the singular number, while the former does. And thus in the Hebrew, יְהִי is singular; but in וְהָיוּ לִמְאוֹרֹת, the verb הָיוּ is of the third person plural. In respect to the former phrases, Rosenmüller [the son] says: *Sit lumina*, q. d. *existat* res, nempe *luminaria*; qua ratione *sem-*

per exponendae sunt hujuscemodi locutiones ellipticae, vulgo pro anomalis habitae, quibus *verbum* cum *nomine* diversi generis et numeri conjungitur; i. e. "the meaning of יְהִי מְאֹרֹת is, *Let there be luminaries*, q. d. let something exist, viz. the *luminaries;* in which way elliptical phrases of this kind *are always to be explained*, which are usually deemed to be anomalous, since the verb is joined with a noun of different number and gender."

So thought and spoke the Rosenmüller, whose opinion on a subject of Hebrew idiom is always entitled to respectful consideration, and whose judgment in a matter like that before us, was hardly exposed to important error. I cannot doubt that he is here in the right; and that no other translation of Gen. i. 16 would ever have been thought of, had it not been for the real or supposed necessities of geology.

Let us now return from this apparently long digression to the consideration of the great question raised on p. 24, respecting the *chaotic* state of the earth as described in Gen. i. 2, viz. whether it was only a ruinous condition of the earth which preceded the fitting it up anew for its present race of inhabitants, and succeeded other stages of its existence as the abode of organized animal and vegetable beings. Our digression has been for the purpose of finding means more effectually to make progress toward our ultimate resting-place in regard to this question.

We have seen that the very substances of light and heat are represented by Moses as being created *after* the תֹהוּ וָבֹהוּ state, i. e. the chaotic condition of the earth. Three days after this, the luminaries of the skies were constituted in their present form, and placed in their present order. If then, as Prof. H. and many other geologists suppose, there were many hundreds and thousands of ages of vegetation and animal life upon the earth, previous to the creation of the *six* days, then, so far as I can see, and surely so far as the Bible is concerned, we are left to suppose, that all these must have been without light, or heat, or sun, moon, and stars.

All the wonders of the Mosaic history, then, sink into insignificance compared with this. Vegetation and animal life for ten thousand times ten thousand ages; without light, or heat, or air! The modern sciences of botany and zoology teach us, indeed, that all these agents are absolutely indispensable to organic life; but why should we listen to these rather than to the fossiliferous strata—the beds of sand-stone and lime-stone and coal? Prof. Sedgwick looks down, no doubt, with contempt upon the man who can doubt the evidence which "the solid frame-work of the globe" places before him, and frowns away the humble doubter in a series of miraculous productions, whose manner and period of existence reduce to insignificance, in comparison with them, the most extravagant tales in all the Hindoo mythology.

There is no way to meet this difficulty, consistently with the Mosaic record, except by shewing that the catastrophe which reduced the earth to chaos, extinguished the luminaries of the skies also, quenched all the caloric of the universe, and annihilated the atmosphere which surrounded the globe. All these were part or parcel of the six days' creations. So much lies on the very surface of the sacred record. If animal and vegetable beings, then, existed before the time when God said, *Let there be light*, they either existed without light, and heat, and air, or else light and heat and air were destroyed by the cataclysm or volcanic eruption which reduced the earth to a תֹּהוּ וָבֹהוּ state. But how could a *volcanic* eruption destroy heat? Or how could a cataclysm destroy light and air? Yea, let it destroy all these in the earth beneath, how could it extinguish light and heat in the heavens above?

I may go further and say, that Prof. H's mode of construing Gen. i. 16, viz. *Let the luminaries be for making the seasons and times, &c.* does not help his cause at all. We are still thrown back upon the *first* day, when *light* and *heat* were brought into existence. This time *followed* his interminable ages of vegetable and animal existence, when the fossiliferous rocks were formed. The

Noachic flood, as he thinks, exhibits only a few and faint traces here and there of the ruins which it occasioned, and these are all on the earth's upper strata. The *ancient* light, and heat, and atmosphere, then, were all annihilated by cataclysms or volcanoes which took place before God re-created these elements on the first and second day: Does such a position as this, now quiet our inquisitive solicitude as to the wonders of creation, or help to stop the mouth of jeering sceptics?

What matters it, moreover, that *divines*, as well as geologists, have sought for such an interpretation of Gen. i. as would reconcile it with some of the positions of modern geology which they were inclined to admit? The question whether a space is left, in the account of the chaotic state, which is indefinite, and sufficient therefore to cover all the ground which geologists demand, does not depend on assertion, nor on the theories of geology, nor on the supposed imperious demands of this science for the allowance of such a space—but it depends on the plain and obvious principles of Hebrew philology and interpretation. To these we may make the appeal, without any doubt or fear whether our principle is wrong. In the application of it, we are indeed exposed to error. But if the narration of Moses—his designed object in Gen. i.—cannot be ascertained and made clear, then I must despair of ever interpreting, with any tolerable degree of confidence, any portion of the Hebrew Scriptures, and come after all to the execrable position of father Simon.

What is the spontaneous impression of every unprejudiced reader of this chapter, who has never mingled in disputes, and is even ignorant of them? Is it that Moses is merely describing a *renovation* of the earth, after a universal wreck by a deluge or by earthquakes? Would he ever get the impression that light, and heat, and air had already existed before, for myriads of ages, and been in full operation on the earth, in the production and nutrition of plants and animals? Never—never. It would seem, then, that some other theory brought in upon the Bible should teach him this, before he would ever suspect it. 'Moses,' he would naturally think and

say, ' is describing to us the *first origin* of all things, the rise of " heaven and earth and all that therein is ;" he is presenting to us that God, who, as original Creator, demands the homage of all the creatures whom his power has formed, or his bounty sustains.'

But I may now go a step further. There is plain evidence in the context, and in the writings of Moses, that he considered all which he relates to have been done in Gen. i. AS DONE WITHIN THE COMPASS OF SIX DAYS.

What is the meaning of the declaration, that the *evening* and the *morning* were the first day ? It is impossible here to take the obvious sense of the passage in any other way, than that the writer compared the alternate periods of light and darkness, which made up the first day of the creation, with the same periods which made up a day when he wrote. His readers could have no understanding at all of his meaning thus definitely expressed, except they made the comparison as just stated, and employed it to interpret the narration. I have more to say about this meaning of the word *day* in the sequel; but this may suffice for the present. Assuming, then, as Prof. H. himself grants, that the measure of a common and natural day is meant, I ask,—What then constituted the *night* which *preceded* the first day ? For that the night which belonged to that day did *precede* it, appears every where from the repeated declarations of the writer, and from the well-known order of celebrating the Sabbath, under the Jewish dispensation. What then constituted the *first evening ?* Nothing is left in the record, but the time when the chaotic state of the earth existed. What says the writer ? " The earth was empty and desolate, and *darkness* (חֹשֶׁךְ) was upon the face of the abyss" (תְּהוֹם). What was this darkness called ? It was called *night* or *evening*. So the fifth verse informs us. Was it the darkness, then, that *followed* the light season of the first day ? No—" the *evening* and the morning were the first day." Here then are the myriads of ages in which weeds 80 feet in length, lizards longer than the anaconda, mastodons, iguanodons, and crocodiles

larger than whales—*monstra ingentia, horrenda*, I might add (if it did not spoil the poetry) *quibus lumina adempta*, flourished and pampered in their inglorious sloth! A night of *twelve hours* for all this!

The Bible gives no more. Moses tells us expressly, in Ex. xx. 11, that "in *six days* God made heaven, and earth, and the sea, and *all that is in* THEM; and then he rested on the seventh day." According to Prof. H. and others, God made the heavens and the earth, millions of ages before this, and rested during all that interval from his work; and his work, as related in Gen. i. 3–31, was only to *refit* the old building which had lapsed. Moses does not seem to have thought so. And in the very passage before us, he plainly adverts to the fact which lies on the face of the narration in Gen. i. viz. the *original creation*, and the *subsequent formations*. "God made heaven, and earth, and the sea:" a usual periphrasis for the declaration that he made the universe. But what more? God made "*all that is in* THEM." Here are the six days' *secondary* creation, the adorning and furnishing the world that had been made. Can the case be plainer than this makes it? And all this as a reason, why the *Sabbath* should be hallowed.

But suppose now, that thousands of ages had elapsed between the greatest of all the Creator's works, viz. the bringing the worlds into their first existence, and the secondary creation; how could Moses speak of merely the secondary and later rest from refitting and readorning the world, and pass in silence the *greater rest* from the most sublime of all the Maker's doings? I cannot force my mind to admit the thought, because of its evident incongruity.

Professor H. refers to Gen. ii. 4, "in the *day* that the Lord God created the heavens and the earth," as an example where we must give the language a liberal construction, in order to avoid a contradiction to chapter i. which asserts that in *six days* the creation was completed. But here he fails to discern the true idiom of the Hebrew language. Nothing is more common than for it to employ the word יוֹם *(day)* to designate the simple or

generic idea of *time, season.* This is by a synecdoche common to all languages, where a part is taken as a representative of the whole. To say, "*in the day* that the heavens and the earth were created," is merely to say, '*at the time* when they were created.' But if the word *day* is limited and defined by numeral adjectives, or by other adjunct explanatory and definitive terms, then the whole case is changed, as we shall see in the sequel.

Professor H. himself concedes,* that "the natural meaning of the words" is as I have stated. I cannot but think the critical reader at least will feel, that the passage is fairly susceptible of no other interpretation than such an one as I have given it.

Nor will it afford any relief to the difficulty thrown in the way of the ante-chaotic existence of the world by Ex. xx. 11, to suggest that the word there rendered *made*, is עָשָׂה and not בָּרָא. Who does not know that עָשָׂה often means the same as בָּרָא? E. g. Gen. i. 7; Ps. xcvi. 5. So the participle of this verb signifies *Maker*, Job xxxv. 10; iv. 17; Is. xvii. 7; xxix. 11; Hos. viii. 14. And so the word עָשָׂה is often used in its secondary sense of *making*, as equivalent to בָּרָא in the like sense, to which, indeed, some of the above examples belong. Nothing, therefore, is gained on the side of geologists, by appealing to עָשָׂה in Ex. xx. 11.

We have done with *chaos* and *night*, after having sought in vain for the myriads of ages in them in which lizards and crocodiles flourished. Let us come now to the *day* of creation, in which some geologists seem to place more confidence, and profess to see clearer than in the *night.*

We are told from many quarters, and from those to which, in a scientifical respect, we should listen with great deference, that '*day* may mean an *indefinite* period of

* See Students' Cabinet Library of Useful Tracts, No. XIX.

time,—that it often has this meaning,—and that it must have it in Gen. i., or else there is no room to form graywacke, and coal, and sandstone, and other fossiliferous strata, which, inasmuch as they are actually formed, must have had some time in which they were formed; and as they imbed myriads of organized animal and vegetable beings, there must have been some time also when these grew and flourished. Since the creation was completed this could not be; for there has not been time enough scarcely to form a single layer of the thickness that some groups of strata exhibit. During the so-called *six* days of creation, then, there must have elapsed the countless ages of geological formations; for before these, as there was neither light, nor heat, nor air, we cannot well imagine animal and vegetable life to have existed.'

To the law and the testimony, then, I answer; for we are not discussing now what geology has found out to be true, or guesses to be true, but simply what Moses has written, and what he meant. Is the word *day* susceptible of comprehending Mr. Faber's 36,000 years of creation, or the 600,000 years of Macculloch, or the quadrillions of millions of others, or the *indefinite* periods of a more cautious and less extravagant class of geologists? It is a question which may be as certainly and definitely settled by philology, as the meaning of עָשָׂה or בָּרָא, or of almost any Hebrew word which can be named.

First, then, I concede most fully that the Hebrew יוֹם (day) and יָמִים (days), specially the latter, may be and are employed, at times, in an indefinite, i. e. in a *generic* sense. As to the plural, *days*, this is so common, that no examples of it are needed; nor would they be to our present purpose, inasmuch as the question before us respects only the singular form יוֹם *day*. 'The *day* in which God made the heavens and the earth; the *day* in which Israel came up out of Egypt; every thing in his *day;* your father Abraham rejoiced to see my *day;* the *day* of the Lord, (meaning the time when he will inflict punishment); I must work while the *day* lasts; the *day*

of Babylon—of Tyre—of Nineveh, &c.; the *day* of slaughter—of vengeance—of retribution, &c., and many more like instances, prove beyond all reasonable contradiction, that by synecdoche the particular part of time which specifically extends to only one revolution of the earth around its axis, is here employed in a kind of generic or indefinite sense, and means the same thing, or nearly the same, as *time* or *season*. Of this the intelligent and candid reader can entertain no doubts.

But if this reader be also a critical one, he cannot fail to remark, that in all these and all such cases, to the word *day* is appended some phrase which is at once exegetical of its meaning. Thus "the day in which God created the heavens and the earth," might of itself mean simply the day [first day] when he brought them into existence; but the sequel of the sentence adds, "every plant of the field . . . every herb of the field," &c. which shows that the second day, as well as the original creation, was meant to be included. So "the day in which Israel came up out of Egypt," plainly means, not merely the first day when the Hebrews started upon their journey, but also the time which was spent in making their way to the promised land, as described in the early Jewish history. So "the day of Babylon—Nineveh—Tyre," &c. means the time when these cities should be visited with punishment and wasted. "The day of the Saviour, which Abraham saw and in which he rejoiced," means of course the period of time when he showed himself in his incarnate state. And so of all the like instances.

In all cases of this nature, it is quite plain that the adjunct explanatory words point the reader at once to the sense of the word *day*, and warn him that he is not to construe it in the definitive and limited sense which he otherwise would naturally assign to the word. No room then is here left for mistake.

But such is far from being the case in Gen. i. On the contrary, lest any possible doubt could be left in the mind of the reader, there are two *definitive* adjunct expressions, which exclude the philological possibility of construing the word indefinitely. First, the day consists of

evening and *morning*. To construe these *figuratively*, as some have done, involves, I might well say, an absurdity; for *evening* would then indicate a time of gloom, distress, and wasting, and *day* a time of prosperity, joy, and happiness. All this is utterly foreign to the purpose of the writer.

To construe *evening* and *morning* generically, i. e. to make it mean, as Hensler proposes, 'There were evenings and there were mornings,' is utterly repugnant here to the object of the writer. Who in all the world could doubt, that after day and night began there were evenings and there were mornings? And who could ever think of saying, 'There were evenings and there were mornings, *day* ONE?' (יוֹם אֶחָד). Did thousands of evenings and mornings, then, constitute but *one* day? And what possible meaning can *one* day have, if employed in such a way as this? To say that evenings and mornings constituted *days*, were intelligible and veritable; but to say that they made *one day*, is doing a violence to common sense and to the usages of language, of which we should not suspect or accuse the great Jewish historian and legislator.

In truth, nothing can be plainer than that Moses must have referred in his own mind to the evenings and mornings that existed when he wrote, in order to speak intelligibly. How else could he expect his readers to understand him? And how have the world understood him, until a new interpretation has been lately proposed, not by exegetical, but by geological science?

But the definiteness and specific limits thus given to the days of creation, are not confined to what is designated by *evening* and *morning*. *Numeral adjectives* are also added, to make the specification as particular as it is in the power of human language to make it. The *first* day, the *second* day, the *third* day, &c. make it just as certain that ordinary days are meant, as it is when Peter says, that "*one* day is with the Lord as a thousand years, and a thousand years as one day," 2 Pet. iii. 9. Whatever might be said of the simple word *day*, unaccompanied by

definitive adjuncts, matters not to our present purpose. *Here are such adjuncts*, and these not in a single, but in a double form; the day is made up of *evening* and *morning*,—it is the *first* day, the *second* day, the *third*, &c. If both these definitives do not make it particular and specific, and limit it to the usual time, then I do not see how it is in the power of language to do this. A different meaning from the usual one never could have been thought of, had not the stresses of geology imposed such an one upon the text.

I have one remark more to make, which has often been made, but should find a place here. Moses directs that the Sabbath should be hallowed, "because in *six* days the Lord made heaven and earth and all that in them is." But what meaning can be affixed to the words assigning the reason for keeping the Sabbath, in case *day* means an *indefinite* period in Gen. i.; or even in case it means thousands of years or ages? I am unable even to conjecture how the Jewish legislator could have spoken thus to the Hebrews, and have expected to be understood, on any other ground than that the *days* of the creation were estimated as common days were. What would be the *logic* in the appeal to the Jews, by saying, 'Sanctify the *seventh* day; for in six *immeasurable* days God made the world, and rested at the commencement of the seventh period?' All those who were reluctant to keep the Sabbath might well reply to him, 'After six equal periods of immeasurable ages, we will begin on the *seventh* to do as you have required.' And if *analogy* is to be reckoned on, (and surely it is the gist of the argument here,) what objection could Moses make against the logic of this reply?

It is vain thus to urge our barque against wind and tide. What geology has to say we will listen to, and will examine and consider her testimony, when she has made out a consistent and credible one that will bear cross-questioning. But when we inquire simply and philologically what Moses said, and testified, and meant—we know of no rule which obliges us, nay, of none which permits us, to accommodate his words to the deductions of a

modern science, and especially of one, which (to use the language of an excellent observer of nature, Sharon Turner) is " yet in its *babyhood.*"

It is of no avail to reply here, and say, that ' when the Scripture speaks of *the sun as rising and setting*, &c. we apply the deductions of modern science in order to show what it means, or rather to point out what it does not mean.' The two cases are not at all parallel. Every one sees that to speak of the sun as *rising* and *setting*, is to describe in common parlance what appears *optically*, i. e. to our sensible view as reality. Every one knows that even now, after the Newtonian philosophy has been spread through the civilized world, and has become triumphant every where, all the nations of Europe, yea the learned among them as well as the unlearned, continue habitually to speak of the sun as *rising* and *setting*. There is no deceit—no misleading—in the use of this language. Every one understands it to be the old phraseology, and one which is occasioned by optical phenomena. When God speaks to men, moreover, he employs such language as is in common use among them. In this way we account very readily and easily for it, that the Scriptures speak of the sun as *rising* and *setting*. It is no part of the sacred writer's design to teach us the scientific truths of astronomy.

But the history of the creation is a different affair. In one respect, indeed, there is a resemblance. The same *optical* view is taken. The historian every where speaks as an optical observer stationed on a point of our world, and surveying from this the heavens and the earth, and speaking of them as seen in this manner by his bodily eye. The sun, and moon, and stars are servants of the earth, lighted up to garnish and to cheer it, and to be the guardians of its times and seasons. Other uses he knows not for them—certainly of other uses he does not speak. The distances, magnitudes, orbicular motions, gravitating powers, and projectile forces of the planets and of the stars, are all out of the circle of his history, and probably beyond his knowledge. Inspiration does not make men *omniscient*. It does not teach them the scientific truths

of astronomy, or chemistry, or botany, nor any science as such. Inspiration is concerned with teaching *religious* truths, and such facts or occurrences as are connected immediately with illustrating them, or with impressing them on the mind. This is the object and extent of it; and to assume or suppose that it goes beyond this, is assigning a place to it which it was never designed to fill.

While we readily concede, then, that the manner of the narration in Gen. i. is *optical*, i. e. such as would be naturally adopted by an optical observer, yet the *things* there related or described must be carefully separated from the *manner* of the narration. Most plainly it is the writer's design to set forth the facts, that God was both the original and subsequent maker and disposer of all things in heaven and on earth,—that he performed this great work in the period of six days,—that different parts of it were *successively* performed in an order established and decided upon by his own mind,—and that one great, yea exceedingly important truth, respecting the order of the Sabbath and the obligation to celebrate it, is to be derived from the time and order in which the great work of creation was performed, and the rest enjoyed which was consequent upon this work. The exegesis of some geologists interferes substantially with this instruction. It annihilates the force of the appeal in the fourth commandment, or renders it absurd. Such interference, therefore, becomes a serious matter. The question whether we can admit it, becomes one which not only philology should inquire about, but the precepts and sanctions of religion are concerned with it. Geologists will bear patiently with us, then, while we delay a little, and take time to express our doubts, whether what Moses has said can be so readily moulded into a new form, and made to mean almost any thing at the will of him who moulds it.

I shall, doubtless, be met here by some with remonstrances against such exegesis as I have proposed. ‘ You must leave us room,’ it will be said, ‘ to form our beds of coal and our limestone, and our 60 miles thickness of sandstone, as well as our graywacke and many other stra-

tiferous formations. Have this *time* we must; and if you will not concede it to us out of the Mosaic record, then we feel obliged to assume it independently of that. Of what use now is it to drive us over among the sceptics as to the statements of revelation? Allow indefinite ages before the first day of the present creation, and we can go on without annoyance; or allow that the days of the creation designate merely an indefinite period, and then we can in a great measure extricate ourselves from severe embarrassment. Why do you wish now to interpret Scripture so as to make us sceptics?'

I do not. It is one of the last things that I should court. But, on the other hand, I have to ask, Where is the interpreter of Scripture to go for his maxims and rules in order to interpret an ancient writing? Is he to resort to a recent science, in order to explain what was written some 4000 years ago? Then the state of modern Greece under the Turks may interpret the Iliad; and that of present Italy the Eneid, or the works of Livy. But all must see that this will never do; and therefore philology cannot concede the right of geology to put a meaning on the words of Moses of which they are not fairly susceptible.

Besides, if philology were to be thus complaisant and yielding, and thus to form and fashion herself at the pleasure of every new science or mode of philosophizing, what confidence could be reposed in her stability or her verity? None at all. Her character would at once be ruined; and the whole science of interpreting language would soon come to the plight in which Father Simon represents all the words of the Hebrew language to be. It could never, with any certainty worthy of confidence, determine or decide any matter brought before its tribunal. It would become a judge partial, or vacillating, or cowardly, or one bribed by smiles or awed by threats. God forbid that such a character as this should ever be attached to the philology of the Scriptures!

I repeat it: we have to inquire only what Moses did say and mean, not what present geologists may think that he ought to have said and meant. Even if geology could

show that Moses has committed errors in his narration, it matters not to our present purpose. We inquire simply for his meaning. When we have obtained this, geologists may canvass, if they think best, the question whether he was in the right or in the wrong. This has nothing to do with the immediate business of an interpreter.

Not a few geologists do in fact assume a very grave aspect, when the plain and obvious interpretation of Gen. i. is urged upon them, and seriously enter their *caveat* against this, as driving them into scepticism. In this opinion they may be very sincere and honest; but I do not feel that one should be much influenced in his investigations of the Scriptures by any such appeals *in terrorem*. They have become too common, and been too often repeated, and too often shown to be no formidable matters, to have any great influence over more enlightened and stable believers in the Bible. They are commonly resorted to by such as would compel us, as it were, to believe with them. All religious partisans employ them. The Unitarian tells us that the land will be filled with sceptics, if the Bible is not so construed as to agree with the first and obvious principles of right reason, (which, of course, are the principles that he has adopted.) The Universalist tells us, that if we maintain the endless punishment of the wicked to be scriptural doctrine, we shall destroy all the credit due to the Scriptures. The advocate for the highest notions of imputed sin and righteousness warns us, that shipwreck is made of all faith in the divine word, unless this doctrine is fully admitted. His opponent is very prone to say, that if such a doctrine be admitted, all credit in revelation is at an end. And so with other partisans. The time was, moreover, when the stupendous ages of the Chinese history and astronomy were brought in upon European faith, and arrayed against it, in order to dash it upon the ground. Voltaire and his compeers mocked at the limited age assigned to the world by the Mosaic records, and appealed to the astronomical science of the "celestial empire," as palpably disproving it. Later still, the famous Zodiac at Dendera in Egypt was found, which assigned to the sun a place in the

ecliptic, that he could have had only some thousands of years before Moses allows the sun to have been created. Jubilee was kept by the infidel corps at Paris when this was made known, and all Europe was made to ring with the notes of triumph over the Divine word. This is quite fresh in our memory; and we cannot but think of it and reflect upon it, whenever we hear the *caveats* of some geologists.

But what now has become of the Chinese legends? They have quietly taken their places by the side of the grave histories of the deeds of Vishnu and Siva, or along with Ovid's *Metamorphoses* and Palaephatus' *Incredibilia.* Esop's Fables are realities in comparison with them. And where, too, is the *astronomy* of the "great and learned nation?" Along with the mathematics of the New Zealanders. And the *Zodiac*—the famous Zodiac which afforded occular demonstration of the place that the sun occupied when it was constructed—what has become of this? It has shrunk down into a petty symbol of enchantment, devised by some wiseacre-astrologer, and affixed to a temple erected in the time of the Caesars!

So perishes, in succession, every thing that rises up and threatens the credit due to the divine word. So, I must believe, will perish at last every theory that contradicts the plain and simple words of Moses, in his history of creation.

It is not my intention, to urge here, grounds at any length, why I hesitate to adopt the results of recent geology. I am no geologist; and it would be folly and arrogance for me to enter into competition, on the scientifical ground or practical part of this branch of philosophy, with those who have devoted their lives to it. Yet it may be allowed to a by-stander, *si posset rectum dignoscere curvo,* or even if he be one *qui possit puteum foamve vitare,* to suggest a few doubts as to the legitimacy and strength of some of the reasoning employed by most geologists, and to enter his protest, however feeble, against some of their extravagant positions.

A word, in the first place, as to this last topic. Nothing is plainer than that all is yet conjecture and uncer-

tainty among geologists, as to the length of time since the earth was first created, and which was taken up in the formation of the beds of strata. Boubée, a recent able Parisian writer, makes the whole period at least 300,000 years. He even understands the matter so well, that he designates four different periods for different formations; the first was for the cooling of the earth from its state of incandescence, and this lasted 60,000 years, [warm weather it must once have truly been in these lower regions!] the second was for the growth of organized beings, plants, and aquatic animals, and lasted 200,000 years; the third produced animals, and also vegetables, and lasted 30,000 years; the fourth witnessed a universal deluge, after which man appeared, and this comprehends 8000 years.

But after all this, Monsieur Boubée is immeasurably outstripped by the famous English M'Culloch. The latter says, that 200,000 years are the least period that can be allowed for the formation of the beds of coal at Newcastle; and at least 600,000 must be allowed to form the oldest strata of sandstone in Scotland, which are 3000 feet in depth. Not content with this, he sends the inquirer to the Apennines and the Jura mountains, and bids him compute for himself there. Nor is even this all: Prof. Pallas has found successive strata 60 miles in depth. 'Let the reader now compute,' says our English philosopher. If he do, then he will find that the earth, according to M'Culloch's statement, is considerably more than sixty millions of years old! Truly the planet we inhabit is venerable for *age*, if for no other quality!

And how are the calculations of this sort made out? I will adduce a passage from no mean adept in all the natural sciences, who, after having spent a long life in the earnest study and pursuit of them, seems to be in a much better state to judge fairly and candidly of the whole subject, than those enthusiastic men are who have some favourite theory to maintain.

"How illusory all such suppositions are, and therefore how unworthy of the attention of rational men, is strongly shown by the circumstance which Cuvier notices. One author inferred from the appearances in the mines of Elba, that they had been worked 40,000

years ago. Another, after examining the same thing, reduces this time to 5000 years. Thus the eyes and judgment of one saw, in the same natural circumstances, only what 5000 years could have accomplished; while those of the other inferred that 40,000 years were requisite to produce them. All the speculative conclusions of the extravagant duration of the earth, from the consideration of the nature and remains of its rocky beds and their organic fossils, are precisely of this character. The assumed period is made large or small, according to the fancy of the individual who theorizes upon them; and yet what stronger demonstration can we have that such conjectures have no real foundation at all, when very different periods are thought to be equally inferrible from the same phenomena? Such contrary deductions by men of abilities and science, from the same natural facts, seem to me to be satisfactory evidence that these phenomena, though they truly mark the succession, give no evidence at all of the chronology, of the deposites and formations."—*Sharon Turner's Sacred History*, Vol. II. p. 270.

To all these and many more of the like speculations, we have now to add the new edition of Lyell's *Principles of Geology*, four volumes published during the current year, who holds the conspicuous place of *President* of the Geological Society of London. This work, as a eulogistic and somewhat able reviewer in the London Quarterly for last April very gravely affirms, "will always form an epoch in the history of geology." Perhaps it will do so. Epochs may be formed in a good many ways. When the Jews quitted Egypt and bent their way toward the land of Canaan, this made one epoch;—another was made when Nebuchadnezzar burnt down to the ground their city and temple. Mr. Lyell's epoch, one would think, might best be compared with the latter; for he has arrayed himself against the theory of all geologists, who, like Professor H. hold to "vaguely-imagined revolutions, and convulsions, and deluges or cataclysms," as causes necessary to change the former face of the earth, to heave up the mountains, to break through and upheave and protrude the solid strata, and to imbed and destroy the muscles, and lizards, and gigantic weeds of the days of yore. With unsparing hand he has swept the board of the Cuviers, the De Lucs, the Bucklands, the Maccullochs, and all of the like stamp, and shown that all their theories are mere dreamy phantasms. "Inquiries,"

says his reviewer, " into *causes* were too often discountenanced; and, in short, a science of the history of the globe had shrunk into little else than *a barren descriptive arrangement of the rocks which coat our planet, their superficial extent, and relative superposition.*" But now for the remedy. Mr. President Lyell has found how to cure the languishments of this favourite but maltreated science. All that is needed is to suppose that the same causes which are now operating on our globe, have always been in operation in the same *manner* and *measure;* and this is enough to account for all the phenomena which it exhibits. So certain is Mr. Lyell of his calculations, that he has given us a map even of the *terra firma* in Europe and other places, at the time when the *tertiary* formation of the rocks began.

Mr. Lyell is said by his reviewer to have demonstrated, that the formations around Etna must have required an " immense series of ages, anterior to our historical periods, for their growth;" and also that " no devastating wave of a diluvial character can be supposed to have swept over them, such as is assumed by some to have characterized the Noachian deluge." Having thus made a " new epoch," by disposing of most of the geologists of the present day, Mr. Lyell tells us at last, in reference to the age of the earth, that " to assume that the evidence of the *beginning* or *end* of so vast a scheme as is comprehended in the globe, with all its animate and inanimate contents, lies within the reach of our philosophical inquiries, or even of our speculations, appears to be inconsistent with a just estimate of the relations which subsist between the finite powers of man and the attributes of an infinite and eternal Being." He had before tacitly set aside the authority of revelation to determine the *beginning* and *end* of the earth; and now he denies that philosophy is adequate even to speculate with probability upon it. To this I could give my assent, when simply declared; but the meaning of Mr. Lyell evidently is, that neither Scripture nor philosophy can do any thing towards disproving the affirmation that the earth is eternal.

' What will come next in geology?' is a question which

one is at every turn compelled to ask. The latest edition of it brings us back, it seems, to the old heathen philosophy,—viz. that the world is eternal, or at least that there can be nothing of weight alleged to show the contrary. There is one comforting view, however, which we may take of this,—viz. that since nothing can be worse, we may hope that the next revolution, which makes another *epoch*, will be somewhat for the better.

Of such views as those of Pallas, Macculloch, Mons. Boubée, Pres. Lyell, so unharmonious, conjectural, in many respects directly opposite, and, to my apprehension, in some of their own parts self-contradictory, I can only say, but must say with emphasis too, *Quodcunque mihi narras* SIC, *incredulus odi.*

Thus much for agreement and certainty among geologists in regard to this whole subject. Next as to difficulties that accompany some modes of reasoning prevalent among many of them.

(1.) It would seem, from the common position of most geologists, to be certain that God did not originally create *earth* and water, with various rocks, mineral elements, &c. but only water and fire, with the infused elements contained in the former, which, by heat and by deposition, formed first the primitive and then the stratified rocks, out of which all *soil* is formed by decomposition, dedritus, &c. with the accession of such masses, &c. as would attach themselves to the rocks. Let us take the world, then, as it was after the alleged formation of the primitive rocks—and what was it? One vast solitude of nothing but rocks, and water, and fire. From these all the subsequent preparations for animal and vegetable life sprang; and these were made, and could be made, only by the lapse of almost interminable ages.

Yet Moses does not seem thus to describe the operations of the Maker of heaven and earth. "God said, Let the waters under the heaven be gathered together unto one place, and let the *dry land* appear." Was this dry land nothing more than crystallized *rocks?* Let us hear what happened one day after this: "God said, Let the earth bring forth grass, the herb yielding seed after

his kind, and the fruit-tree yielding fruit." Such is the order and succession of events in Moses. But geology asserts that what takes place now in the slow disintegration of rocks, &c. must have always taken place after the same analogy, and occupied the same proportion of time that it now does. If not, then all its conclusions are baseless, in regard to the length of time requisite to the formation of earth. But how can it be possible to show that when God made the world, he did not prepare it from the first for an abode of organized and animated beings? So Moses thought and has averred; and it seems to me to be very much like calling in question the power, and wisdom, and skill of the Creator, to suppose that he should employ myriads of ages to bring the earth to a state in which it could support animated beings.

(2.) The secondary and tertiary strata, which are fossiliferous, and whose formation, it is said, has taken up so many myriads of ages, present some serious difficulties to a bystander, who looks on more for inquiry than for the establishment of theory. Animals and vegetables without number, we are told, fill these strata on all sides. But what are they? Most of the animals in the lower strata are *marine*, and destitute of the power of locomotion, i. e. they are muscles and other testaceous substances. Then the animals and vegetables in the secondary strata are said to be entirely *different* from those in the third, and from any that are now existing. Even of the 6000 species of organized beings that are found in all the strata, not more than *one-tenth* part are now found among living and known species; so that there must have been several total destructions of all the plants and animals, and new creations of them again to occupy the earth. All this and much more of the like kind is proffered to us in the form of veritable facts; and the conclusion drawn from it is, that countless ages must have passed away, and entirely new successions of organized beings have taken place, before the present races of organized beings were called into life.

We are told in one place by Professor H. that none of the present races of organic being could have been co-

temporary with the fossilized ones, because of the great differences between the former and present state of temperature and condition. Yet in other places he tells us, more than once, that some 600 of the present species of organized beings are found in a fossilized state. One is ready to ask—If 600 of our present species could exist in former days, what is there to show that the rest could not?

Nor can I forbear to testify my wonder, that Professor H. and many other geologists lay down the position with unqualified assertion and undoubted confidence, that of the 6000 species of plants and animals that are fossil, only 600 of them have any corresponding species now extant. How is it possible that this can be known? But a few years ago the laborious and indefatigable Loudon, (Encyc. Gard. 250,) supposed that the number of plants might possibly amount to some 44,000, of which, however, only some 38,000 had been described. Now, if the authority of such a name as Herschell can give credit to the declaration, from 80,000 to 100,000 species are known. Hardly a decennium since, two enterprising naturalists, Drs. Ehrenberg and Hemprich, were sent out by the Royal Society of Berlin, to explore the Red Sea and the neighbouring high lands of Abyssinia. While they were out on this excursion, they paid a visit to Mount Lebanon, where they discovered some 400 species of plants that were non-descripts among the botanists. With such facts as these staring us in the face, can we safely speak with positiveness about the fossil plants and animals, and aver that they have no counterparts among present existing species? Who can aver, with any kind of certainty, that even one-half of the plants and animals that exist on our globe have been yet described?

Hear now what the M. de Serres, one of the most active and distinguished geologists of the present day, has said (Geogn. Int. XIV.) on this subject. "In the middle of the forms which seem no longer to exist, we discover in a great number of them, SIMILITUDES *to those which characterize our present races.*"

Again: "The number of species considered as lost *is diminishing every day;* while those of the fossil kind, which are analogous to our existing races, *are continually augmenting*, in proportion as we better know the various productions of distant countries, and even of our own region," *Ib.* XV. And again: "The species which we look upon as destroyed, do not differ more from those we have and see, than those which live in New Holland, from the natives of our old continent," *Ib.* XV.

With such facts in view, how can we lay down such principles as Professor H. and others have done, on the subject of fossils, as decided and established? Nothing can be further from *establishment.* Every day is crumbling the fabric to dust. Four hundred *non-descripts* found on one single mountain! How many then in all the earth? And it is only when *all* have been compared with the fossils, that any safe and solid positions can be taken relative to this part of our subject.

Professor H. agrees fully, as do other Christian geologists, that the races of men all sprung from one common parent. How then will he account for the striking varieties in the Chinese, the Caucasian, the Malay, the African, and the Indian races? Is the difference between multitudes of his 6000 fossil races and our present ones, greater or more striking, in most cases, than those between different portions of the human family? I trow not. *Size* is the most important particular of discrepance; and this, the antediluvian climate and air will account for in a great measure, if not entirely.

Reflect for a moment, what difference in the same vegetable or animal is made by transfer to another climate, air, soil, and other kinds of nutriment. All our varieties of the rose seem to have sprung from the simple wild briar or rose,—our potatoes from an insignificant and unhealthy wild plant,—our wheat and rye from wild grain of seemingly no worth,—our unnumbered varieties of delicious pears, apples, peaches, plumbs, &c. from wild and insipid fruit. The whole kingdom of nature is undergoing perpetual variation in this way. There is no end of the species that any one plant will make, by the

aid of climate, soil, air, cultivation, &c. How is it possible, then, to mark out with any certainty the essential difference alleged between fossil and other plants? It is as evidently against the course of nature to do this, as it is against prudence to decide upon cases dependent on facts, when one half of the facts are not yet known or even examined.

But in respect to the strata themselves, and the vegetables in them—what must a simple inquirer, conducted by the laws of gravitation and the nature of fluids, and a knowledge of the perishable nature of trees and plants, be led to think? In the mighty deep which once rolled over the whole earth, was there such a difference of materials as made it deposit in one place strata of such different thicknesses and order from those that exist in other places? By what laws of *fluids*, moreover, have strata so exceedingly different in material and thickness come to be deposited by the same boundless abyss, which had no rivers, or streams, or earth to modify from above its waters? In what part of the ocean has such a variety been constituted, by any action that is known, since the great deluge? Some solution of this immense diversity, in quantity and quality, of sediment would seem to be necessary, in order to bring this matter into a more intelligible shape.

But this is only a part—I might say a small part—of the difficulty. We are taught that it now takes thousands of years only to raise lakes or the ocean a few inches by deposit. Be it so. We will go back, then, and make some further inquiries. Here are monstrous trees, and vegetables from 30 to 80 feet in length, standing upright, moreover, or nearly so, in some of these strata; and yet, forsooth, the form of them is perfect throughout. Even the most delicate and fragile parts of plants and animals have been preserved. How then am I to put these things together? Thousands of years to make a few inches of deposit; and yet vegetables all the while surviving in a *perfect* state, and waiting to be encased in deposit, which perish in a few days, whether in the open air or in water! Professor H. speaks of those

who believe in the formation of things in a perfect state at first, as holding to something that is worthy of the *dark* ages. But in what age of *light* does a vegetable 80 feet high preserve its texture long enough to be fossilized, while it takes 6000 years to make deposit enough around it to encase only a few inches of its height?

Here are *incredibilia* exceeding all description, and beyond all explanation, which I have seen, or which I can even imagine. My humble capacity shrinks from before the comprehension of them.

(3.) But this is not all. We are told that all geologists now agree, that *coal* is formed from vegetation of some kind or other, and, in a word, is only *mineralized vegetation*. Let it be so. But we may now inquire whether it is indeed true, that like causes produce like effects? And if so, how comes it about that *coal* is scarcely if ever formed, except between latitudes 35° and 65°. Is not vegetation more abundant within the tropics than elsewhere? Are there no streams, rivulets, eddies, ponds, mountains, valleys, basins, there to receive detritus or alluvion, and to congregate the material for coal? Do the powers of nature concerned in its formation limit their influence southward to the 35th degree of latitude? Or in lands where coal is found in abundance, as at Pittsburg in Pennsylvania, or at Newcastle in England—how comes such a mighty mass of vegetable alluvion to be collected, yea elevated upon mountains, as at Pittsburg, and yet for hundred of miles, and even thousands, in other parts of the country, no signs of coal are to be found, although the material to form it has ever been abundant beyond conception?

Or if coal was formed during the countless ages that preceded the present epoch of the world, how came the causes which formed it from vegetables to cease, and why is not the process going on, in every favourable spot of the globe surrounded by dense forests and boundless vegetation? Prof. H. insists that the powers of nature have always been operating as they now are. If so, why does he not point us to the like processes now, and shew us that in every eddying place of the mighty rivers of

our country, where vegetable matter, in quantities that exceed all human calculation, has been deposited and collecting for thousands of ages, a stratum of coal has not even begun to be formed?

Prof. Sedgwick will probably smile contemptuously at the want of geological knowledge which these questions betray. And so he would if I were to ask a thousand more of the like kind; which it were easy to do, every step that we advance. But still I am not the better satisfied with his theory, for all this. To my humble conception, strata, and stratification, and fossilization should be represented so as not to contradict the primary laws of fluids and matter held in suspension by them and deposited; and not to contradict the laws of vegetable and animal preservation; nor the principle that like causes must produce the like effects. Strata we can now find where we can trace alluvion; but where is it going on, I might say, in any perceptible manner, by the simple process of deposit from the contents of salt or fresh water? But,

(4.) We shall be told, in order to solve such difficulties as these, that 'causes were once in operation which now no more exist.'

Yet this is the very thing to which Prof. H. now and then most strenuously objects. His ten thousand ages for stratification, is all built on the ground of processes, analogical with the present course of nature; otherwise the argument is destitute of any weight. My difficulty here is the want of consistency. At one time the state of things was so different in former ages, that neither the plants nor animals of the present day could have lived; at another we find among them some 600 species of the present plants and animals. When the interminable ages of a stratum are to be made out, we are told how exceedingly slow this process goes on—a few inches in some centuries. But why may we not suppose that chemical affinities and action were once exceedingly different from what they are now; and that when that action was over, a new relative position and balance of the elements was introduced, which is more permanent and less

changeable? Bring acid and alkali together, and see how long it takes the act of union to be accomplished. And when it is completed, is the material that results from it capable of the same action as the original elements of which it is composed? Take an extinguished volcano, once sending out its lava over all subjacent regions. Why does the earth no longer quake, and the smoke no more hide the face of heaven? Because the force is spent; the agents are exhausted; the action has therefore ceased. And so in regard to the deposit of the strata—a few days would be as good as thousands of ages for the accomplishment of this, on the supposition that it comes from secondary causes, and provided the agencies were in a prepared state for rapid and vehement action.

'But the fossil plants and animals! What is to be done with them? In them is incontestible evidence that this process must have gone *gradually* on. Strata we may suppose to be the effect of rapid action. But the fossil organized beings in them must have had time to grow and flourish, and then to be imbedded. And besides all this, the different strata present races of organized beings which are altogether diverse.'

This, no doubt, is the strong hold of geologists who make the world nearly eternal. The argument from the strata themselves, independently of this, amounts surely to nothing, unless we could ascertain, whether operating causes had always been the same as they now are. So have thought and said men, whose judgment is entitled to the most profound respect on such a subject. Cuvier (Prelim. Disc. p. 27) says: "We are in the most *absolute ignorance*, respecting the causes which have occasioned the diversity in the substances of which strata are composed. We are unacquainted even with the agents which may have held some of them in solution; and it is still disputed respecting several of them, whether they owe their origin to the agency of fire or water."

To the like purpose De Luc: "These strata, *the formation of which has* ENTIRELY CEASED, must have been the effects of primordial causes which no longer subsist;" Lett. Geol. p. 72.

What can be plainer common sense than this? If the like causes were now in existence and operation, as once existed, then the coal-formation would every where be going on where vegetable and mineral substances come in contact; the strata would be forming as of old; the rocks would be springing into existence. New continents would be heaved up from the ocean, instead of some little specks of islands; and new Andes and Alleghanies, and Alps, and Tauruses, and Caucasuses, and Himmalas, would be forming in the midst of the Atlantic, and Pacific, and great Southern oceans. Yet the animalculae that are employed in constructing coral reefs, seem to be almost the only agents in forming new islands, or new continents (if indeed any such are formed). Why this mighty difference between ages within the bounds of history and observation, and ages that were not only beyond the flood, but beyond "chaotic night?" Prof. H. reasons every where in order to prove the unmeasurable extent of the earth's duration, from the analogies of causes now in operation. De Luc has placed the subject in its true light; and thus has he compelled us, as it were, to abandon the whole of the argument in question. If it be true that like causes produce like effects, then it must be true, that the former causes of stratification, &c. have long since ceased; and the insignificant resemblances of it in Deltas and eddying places, &c. which are now presented to our notice, do not serve at all to throw light on what was universal, and of a tenor so entirely diverse, as is that of the solid strata of the globe. How, in circumstances like these, we can put confidence in *analogical* arguments on the subject of stratification, I am not able to see.

To the same purpose speaks Daubuisson, B. I. p. 352. He says respecting stratification: "The nature of this cause, and the manner in which it acted, are, most likely, *for ever removed from our knowledge.* No effect of the same kind is ever now produced.... Its circumstances and its laws still remain a problem to be resolved."

Yet, if I understand Prof. H., he speaks as though every thing went on before or during the *chaotic* times,

just in the same way as now. And so speaks M'Culloch and others; and on this ground we are called upon to believe in the 600,000 years' formation of the sandstone in the Highlands of Scotland. I am not able to comprehend the logic of this reasoning, nor to see how such statements can even be conjectured to have any stable basis.

But I am deviating from my immediate purpose. 'The fossil organic remains—what is to be done with these? Here is ocular, palpable demonstration, that the theory of geologists as to the length of time in which the present earth was forming, must be substantially correct.'

I will not, as some have done, maintain that all the fossil phenomena of organized beings are merely apparent, and not real specimens, mere *lusus naturae* and not actually what they would seem to have been. That there is much of illusion in this matter, I am ready to believe; for if one were to go into an extensive cave where stalactites are found, he might easily enough find resemblances to living things so close, that he would be ready to pronounce them petrified animals, &c. But I do not wish to stop a moment on this ground. I will admit the realities alleged. So far as *argument* is concerned, we may as well admit them all, as to admit one specimen.

'How then came there down so deep in the strata both animals and vegetables? And how comes it that the tertiary formations include no species found in the secondary ones?'

As to these last questions, the remarks made above suffice. As to the rest, I answer very readily, that I am prepared at once to confess my ignorance here. When geologists will tell us of the causes of stratification, and shew how this could once take place, and is now no more going on, then we may pledge ourselves to tell how the fossil organic remains became deposited in the strata. To argue the necessity of successive *new* creations, as Prof. H. does, seems to be altogether unnecessary. Let me repeat the question: How extensively has the earth been yet explored by geologists? The answer is, in va-

rious parts of Europe, and in a few places in America. Even in the places explored, different animals are found in the same strata in different countries, and sometimes in the same country. There was no time, then, it would seem, that the earth was stocked with the same animals all over its surface, or even over the same country. There might be some birds, beasts, fishes, and plants, in common, in all countries. But specific differences existed most plainly, (as they now do), not only in different countries, but in the same country.

Supposing, then, that deluges or earthquakes had destroyed the animals in Canada and to the northward, how does it follow, that when that country became habitable again, animals from other regions did not emigrate there, which were of species quite different from the former natives of the country? It is impossible to disprove this; nor can it even be rendered improbable, except by assuming, as Prof. H. every where does, that successive cataclysms or earthquakes drowned and rent the *whole* globe at one and the same time. On what basis such a theory rests, he has not told us. Nor is the thing probable, nor even conceivable, under any of the common operations and developments of fire or water. It was the miraculous interposition of almighty God, which "opened the windows of heaven for 40 days and 40 nights," and which "broke up the fountains of the great deep,"—it was that only which made or could make a Noachic deluge. Cataclysm or earthquake from natural causes alone, must be partial from the very nature of the case, unless we suppose the crust of the earth to be so tenacious and solid, that all of it must be blown in pieces when one part of it was affected, or that all of it must fall in when a deluge came over it. How can philosophy maintain either of these positions?

Different races of animals, then, may have been introduced into particular regions that had been destroyed, and were refitted for inhabitation, without supposing any new creation. And what is true of animals is most palpably true of vegetables, for these propagate on all sides by the winds and the fowls which eat their fruits for

food; so that extension towards any quarter, and for any distance, seems to be a problem that hardly needs much effort for its solution.

Partial floods and earthquakes, then, and successive ones, may have occasioned all the phenomena of which geologists take notice. How long an interval there was between these, we surely cannot tell. Long enough it was for the animals to grow which are imbedded in their deposits and wrecks. Yet the accomplishment of this did not need any very long time. It seems agreed on all hands, that the climate of our globe was once much warmer than it now is, inasmuch as *tropical* animals and substances are found in almost all parts of the strata that have yet been examined. How long, then, does it take for plants to grow, in a genial soil, with abundance of moisture, and with great heat? The last summer, some Indian corn in a field that I cultivated, grew 7 inches in 24 hours. The growth of Jonah's gourd is hardly miraculous in some soils, and in certain states of the atmosphere. This last circumstance I mention as essential; for it is now a conceded point, I believe, that *air* has very much to do with the growth of plants, perhaps even more than soil. Suppose then an antediluvian state of air, such as when men lived nearly a thousand years—would not animals and vegetables flourish in proportion? We can scarcely doubt it. In the 1600 years and more, then, before the Noachic deluge, many, very many, races of plants and animals might have had succession in any particular place that was repeatedly destroyed.

Nothing hinders us, therefore, from supposing that those portions of the earth, which have as yet been geologically examined, were subjected to various successive catastrophes. Moreover, there can scarcely be a probability made out, that Europe, or America, or New Holland, was inhabited by antediluvian men. Of eastern Africa this may be possible, but, excepting Egypt, it is scarcely probable; and so the phenomena of the earth would seem to testify, according to the usual statement. No human skeletons, it is said, are found stratified in Europe or America; at least it is averred that very few

have been found, and that the condition of these is doubtful. It remains to be seen, if we admit this to be true, whether there are any in Asia, scattered over the ground in the Armenian, Babylonian, and Mesopotamian region, where the antediluvians lived. Who shall assure us that human remains are not here to be found, even in the lowest of the secondary formations?* Is it not pre-

* I am unable to see how Professor H. could state with so much confidence as he does, (Students' Cab. Lib. No. XIX.) that 'no remains of man occur until we arrive at the highest strata. It is only in the loose sand and gravel that *cover the surface* that *human* remains have been found at all: and to this day it is doubtful whether any of them can be referred to a period as far back as the last general deluge. . . . Why, then, if men existed with the animals now entombed in the secondary and tertiary rocks, are they not found [*i. e.* in company with the animals in these rocks] as they are [found mixed] with postdiluvian remains? The conclusion is *irresistible*, that he [man] was not their contemporary.'

See how confidently a sensible geologist can reason from his *supposed* facts and philosophical premises, and yet be utterly mistaken as to the one and the other, so that all his reasoning is baseless. 'Donati found human bones in the breccias of the Dalmatian mountains, which has since been confirmed by the repeated examination of Germar. Canobio found them in a calcareous tufa near Genoa.—Bulletin Univers. 1826, p. 22. Boue saw them, in the year 1823, behind the lake in Baden; and Count Razoumovski, in Lower Austria, mixed with quadrupeds, partly *extinct*. Count Breuner found them near Krems in Lower Austria. M. Sterberg met with them at Kostritz in Saxony. Others have been seen among the Caraibs and the inhabitants of Chili.—Bull. Univ. 1830, p. 296, 162. In France, human bones were found a short time since in two caverns, in the departments of Gard at Poudre and of Jouvignarque, mixed with mammalia ones. . . . Others were found at Bize, in a black mud, mixed with those of *lost* animals.—Bull. Univ. 1829, p. 237. M. Renaux saw human bones in 1820, in a grotto of Jura-limestone, at Dufort.—Ib. 1830, p. 30. M. Bernardi found them with the bones of hippopotami, in a grotto at Mount Griffon near Palermo.—Gior. Offic. de Palermo, Apr. 1830. A human skeleton was found in travestin in Auvergne; and a *fossil* human head in the travestins of St. Alisse at Clermont, by Le Coq.' [*Travestin* I take to be a kind of white spongy stone.] More facts of the like nature may be seen in Bull. Univ. 1830, p. 34, 6.

Such are the recent facts, which are in direct contradiction to Professor H. and most of the later geologists. They will concede that *Breccias* and *Jura-limestone* belong to the *secondary* rocks.

sumption for geologists to draw conclusions as to what exists or may exist in Asia, the cradle of the human race, merely from what exists in Europe and in America? They profess to build their science on *facts*; and yet facts in regard to the regions of the earth first peopled have not been examined, at least not to any extent that is worth naming. The alleged facts, moreover, as any one may see in the note below, are altogether erroneous.

Add to all this, that the earth itself, which is some 24,000 miles in circumference, has never been penetrated more than about a mile below its surface. This is no deeper than the scratch of a pin would be on a 24-inch globe. How can we place any great confidence in examinations so partial as these! Every day is bringing to light new facts, which are modifying the theories of geo-

Yet here are *human* bones; and human bones are found too mixed with the bones of the races of *extinct* animals. Professor H. lays the corner-stone of his system of countless ages in preparing the world for the habitation of man, in the position that the *secondary* rocks bear abundant testimony to the fact, that many races of animals now utterly extinct existed *before* the race of man arose. The testimony, he avers, is indubitable, because *man* is found 'only in the loose sand and gravel that cover the surface of the earth,' at the top of the *tertiary* rocks. Yet it is now known abundantly that human bones are found in the *secondary* rocks of the submedial order, and also mixed with the bones of extinct animals, which are supposed by Professor H. and others to have been swept from the earth before the creation of man. The whole building, then, erected on such a foundation, must fall. Yet geologists, a short time since, were just as confident about the destruction of a multitude of animal races *anterior* to the creation of man, as they now are in regard to other parts of their system. They have admitted, pretty generally, that man has not been in existence more than some 6000 years. It would seem now to be quite certain, that he has existed at least as long as the animals in the secondary rocks. How lame the conclusion heretofore was, that because human bones had not been found in the secondary rocks, they could or would not be found in them—facts now sufficiently testify. Why cannot some geologists learn caution from such fundamental admonitions as these? In the end, perhaps, we shall see, when the earth is more extensively investigated, that Moses was not so ignorant of the creation as some of his correctors would seem to represent him.

For the substance of the facts in the above note, I am indebted to Sharon Turner, Sac. Hist. Vol. I. p. 385.

logists. It is not possible that it should be otherwise. So very small a portion of the phenomena of our globe has yet been examined, that I can in no way imagine how a very cautious man should form any *general* theory with confidence. In constant succession one geologist is pulling down what his predecessor built up; and this not from mere theoretical reasoning, but from new facts which have been brought to light.

Surely the plains and hills of Middle Asia should have been fully investigated, before we determined positively that plants and animals existed long anterior to man. If the skeletons of men should be found every where or any where intermixed with the organic remains of plants and animals, (as we now know they have been in Europe,) then the whole question is presented in a form that is new. Why should we decide what must be true of Asia, before Asia is examined?

That great changes and violent ones may have existed in parts of the earth which for a long time were emerging and forming, and which were not inhabited by primitive men, we need not deny. But that *many* successive, great, and general catastrophes have befallen the primitive abodes or seats of men, remains yet to be proved. Hitherto it has only been assumed.

But I must write a book, if I undertake to count up the difficulties that present themselves to my mind in the way of Professor H.'s theory, and that of Macculloch and other like geologists. On every side I find these difficulties rising up, more thickly than armed men did from the famous tooth-seed that was sown by Cadmus. I despair therefore of even naming them for the present, much more of fairly and fully presenting them.

One or two things more and I have done. I have before me the letter of an eminent geologist of our own country, and a most excellent man, which tells me of plants of an elevated stature, with all their delicate leaves and even blossoms so perfectly preserved, that the true, proper, and relative position is not at all changed. This shows, as he thinks, the most perfect *stillness* of the great subsiding abyss, which had overwhelmed them, and after-

wards encased them in its deposit. How different a state of things this must have been from that of the volcanic eruptions and cataclysms of Professor H. is sufficiently plain. But then, while one is listening to the story of this peaceful cataclysm, more still and slow in its movement than the Styx itself, he cannot help asking the question, whether there ever was a time since the earth existed and the atmosphere was created, when there was no tide in the ocean-waters, and no wind over their surface? If so, how the most delicate parts of a plant, even the very petals of its flower, should preserve their exact natural and relative position—is at least more wonderful to me than any thing in the Mosaic cosmogony. When I read such things as these, I am ready to ask, whether the geologist is mistaken in the exercise of his diagnostic powers, or whether nature has in times past forgotten herself, and abandoned on some occasions the exercise of her essential powers? And even supposing such things to be matters of fact, and that there is no mistake in the judgment about them as such, yet I am disposed to say, with Kepler, a worthy descendant of the old astronomer of the same name, and now living in Germany, who has defended the Mosaic account of the creation against some doubts raised by Schleirmacher and Brëtschneider, "There are things in heaven and on earth which philosophers do no yet understand."

The most repulsive point of all, in this system of the quasi-eternal generation of the earth, remains yet to be mentioned. Think of the creation as represented to us by Moses. "God spake and it was done; he commanded and it stood fast." The sublimity of the Almighty fiat, "Let there be light!" and the instantaneous succession of the event ordered by this command made a deep impression even on the heathen Longinus, who has distinctly noticed it. Well it might. Wherever there is a nice sense of τὸ καλόν and τὸ πρέπον, such a result would seem to be inevitable.

Then, again, *all at the* BEGINNING *is* VERY GOOD. So God himself pronounced it to be; so analogy of the creation, if we reason from the perfect state in which man

was at first created, would lead us fully to decide. So the *ideal* of a Creator's work, fresh from his hands, would lead us to suppose. Chaos itself could last but only for one night. Light from heaven broke in, as this state of things was so unlike that which was intended by the Creator to exist in the end. All now in this picture is in perfect harmony with our instinctive ideas of fitness—all agrees with our most exalted conceptions of the power and wisdom of the Maker of heaven and earth.

Not so with the picture of some geologists. Their system compels me to think of Sysyphus' efforts to place his stone on the top of the hill—toiling and labouring without any actual progress made. Not much unlike this would seem to have been the efforts of the Creator, (I speak it with deep reverence,) if it be true that some 36,000, or 200,000, or 600,000, or 60,000,000 years were demanded, in order to get the world into a state of forwardness sufficient to make a comfortable habitation for man. 'Sixty thousand years to cool in! 200,000 for plants, aquatic animals, and the formation of coal-beds!' as Monsieur Boubée gravely tells us. What an infinitude of labour, too, in order to make *fuel* for man! And then to think of 200,000 years for snails, and muscles, and lizards, and crocodiles, and alligators, and dragons, and the like! Thousands of ages, then, the world was without a lord or a head. The image of God, whom he constituted his vicegerent here below, for myriads of ages not created! His dominion put off for thousands of centuries before it began to exist! And who, all this time, were the actual lords of the creation? Lizards and alligators of more than Typhoean dimensions!

When I think soberly of such a picture, I feel constrained to turn away with unspeakable loathing. I am forced to exclaim, 'Is it true, then, Creator of heaven and earth, that in *wisdom* thou hast made all things?' Yea, I cannot help opening my Bible at the eighth chapter of Proverbs, and reading with intense delight the refreshing view there given of eternal Wisdom, which guided the councils of the Almighty in his *creative* work. 'Before the mountains were brought forth, be-

fore the earth was, when there was no depths—Wisdom was with God, and was daily his delight. It was this which guided all his counsels,—this formed the earth, the fields, the highest part of the dust of the earth,—this prepared the heavens, and set a compass on the face of the deep.' All this Wisdom did, but for what purpose? To create a residence, during countless ages, for snails, and lizards, and iguanodons? Had eternal Wisdom, then, any joy in these? No: Solomon never once dreamed of its being so; for he declares that Wisdom "rejoiced in the habitable parts of the earth, and her *delights were with the* SONS OF MEN."

This now seems to be probable, rational, satisfactory, refreshing. I can drink in this with a most hearty relish, and believe it to be all literally and verily true. Yea, I can believe that since the fall of man, (or possibly even before,) odious animals made their appearance in this world of sin and guilt, just as thorns and thistles grew up as part of the curse. I can even suppose that they might have been originally formed, although very little prevalent; for, as the vulgar proverb has it, 'All sorts of creatures are necessary in order to make a world.' But a world of *Sauri* or lizards, and of beings not possessed of locomotive powers! Myriads of ages given to such lords of the creation to rule over it! It actually seems to me to require more credulity to believe this, than to believe in Brydone's statement of the ages necessary to form the strata of *earth* (as he would have it) between the layers of lava, (which, on examination, proved to be ferriginous *lava-ashes*,) or even to credit M. Dupuis' demonstration made from the zodiac of Dendera, that the temple in which it was found must have been built at least for 15,000 years.

A world without *man* will always seem to me like a body without a head—a planetary system without a sun. Is not such a world a creation of insignificance and contemptible existences, instead of the images of the living God?

I have done, although I have said but little of what I might have to say. With geologists, as men of science,

I have neither the ability nor the disposition to enter into controversy. Few men could be named, in our country, who are more worthy of its esteem and confidence, than some of this class are among us. There are few, indeed, whom I love and honour more; and among these are men, whose views are in direct opposition to the principal ones which I have been here defending. But I have said enough already to show that my aim is not to hereticate them, but an express an honest difference of sentiment, and one which, as my remarks above will show, I feel somewhat strongly. While I have the fullest confidence in the piety and integrity of some geologists, who differ widely from me in their views of the Mosaic cosmogony and their theory of geogony, yet I am not persuaded that their sentiments are matters of mere speculative indifference, or that they ought to remain unexamined or unopposed. I have verily believed, that the whole subject, viewed in certain lights, is one which is adapted to render the mind sceptical, as to revelation, before it is aware,—inasmuch as it begins its operation away at a great distance, for it seems to concede to Moses the credit which he can fairly claim. By and by the mind comes to regard him as a man unacquainted with philosophy, and astronomy, and natural science; and then insensibly to rank him among the ignorant and unenlightened, although he is admitted to be a well-meaning man. I do not say that such an effect is always produced by geological speculation, for I know of examples which would disprove this. The gentleman whom I have mostly had in view in my remarks, is a conspicuous example of this character.

Geologists, I trust, will neither malign me nor laugh at me for expressing my honest doubts. It is a free country where one may yet speak his opinion, (at least on most subjects,) if not without controversy and accusation, yet without having the *right* called in question. My doubts are such as pervade the sober and reflecting part of the religious public somewhat widely, as I believe. Geologists should therefore rejoice that I have given them an opportunity and a call to remove the doubts

that yet becloud the way of so many, and hinder their journeying along with them. If they find in me all that Professor Sedgwick charges upon the Penns, and the Buggs, and the Nolans, as to the want of knowledge respecting their favourite science, they will at least do me the justice to concede, that I have made no claims to a knowledge of the details of that science. I only venture myself into such a kind of place as the shoemaker did, who criticised upon the inferior part of the immortal work which the great Athenian statuary had executed. If my objections are not even as well grounded as his, it may still be best to hear them with patience,—inasmuch as the great mass of men among us are as yet harassed with difficulties like my own.

On the other hand, should they lay their hand heavily upon me, and threaten to castigate my ignorance of geology, and my adventurous spirit in calling in question what I have not thoroughly examined, and presuming to argue with those who have studied deeply, then I have two things to say, in order to induce them to alleviate the severity of their strokes;—the first is, that the *logic* of men who reason from certain facts, real or supposed, as connected with a science, may be a fair and legitimate object of critical examination, even by some who are not versed in the detail of the science in question;—the second is, that those who bear hardly upon others for meddling with their *geology*, should keep a good look out how they middle with Hebrew *philology*. The digging of rocks and the digging of Hebrew roots are not as yet precisely the same operation, and are not likely soon to be so.

But whatever judgment they may form of my objections to their views, I must crave the liberty of presenting anew to them and to the public, some excellent remarks of a veteran in the natural sciences, who has spent his life in the animated pursuit of them, and near the close of it has given us the result of his thoughts and examinations in relation to the subject before us. I refer to Sharon Turner, and to a passage in Vol. I. of his Sacred History, p. 35, seq.:—

"Although it is true that many of the geological phenomena have been represented by these observers, and others, to indicate that our earth has had a much longer duration than the strictest import of the terms used by Moses can allow, and especially in the succession of its organized races, yet, after the most patient comparison and consideration of their facts and reasonings, I cannot but feel that they have not at all advanced beyond plausible conjectures, as I also perceive that they are mostly at variance with each other; and that as fast as one theory of this sort is set up, it has been found to be wrong by a succeeding inquirer, who attempts, in his turn, to establish a different one, of the same tendency, in its stead. These are all fair exertions of ingenuity, and arise from a desire to let no fallacy stand, and from a love of exploring what has baffled anterior research; but these circumstances prove that none of these theories are true,—that the right theory has not yet been discovered,—that erroneous deductions have been made from the phenomena which have been seen,—and that these are not yet justly understood, nor their real bearings discerned. Hence, I continue in the belief, that whatever is true in fact and correct in inference on this subject, will be in the end found to be not inconsistent with the account of Moses, nor with the common meaning of the expressions he uses. In studying the Scriptures, it is peculiarly desirable that we should, on no occasion, depart any more from the usual and natural meaning of the words and phrases which there occur, than we do in reading any other author. They have been greatly disfigured by the forced construction which most men seek to put upon them; and much dissatisfaction has by this conduct been excited in the intelligent mind. The true construction of every part must be, not the possibilities of meaning which refining ingenuity may draw from the expression, but that sense and purport which the author himself, in penning them, intended that they should express. His personal meaning at the time, and not the import which our verbal criticism can now extract, should be the great object of our attention. In the present instance, I think Moses meant to express six natural days; and therefore it appears to me to be most probable, that whenever the right theory on the fabrication of our earth, and on the era and succession of its organized beings, shall be discovered, it will be found to be compatible with the Mosaic cosmogony, in its most natural signification. But until this desirable event arrives, there will be as much incongruity between this ancient account and our modern speculations, as there cannot but be between the devious excursions of an active imagination, and the simple and solid, but unattractive reality. Our German contemporaries, in some of their reveries on ancient history, are equally alert to prove that novelty of fancy is more sought for by many than justness of thought,—that it is easier to argue than to judge,—and that even truth becomes weariness when it ceases to be original, and has lost the impression of its beauty by its habitual familiarity.

"It is quite true that Moses did not profess to be a geologer, and had no business to be so. His object was, not to teach natural science, but to inculcate the existence, the laws, the will, and the worship of God; and to found the polity and social manners and institutions of his countrymen, on this only true foundation of national prosperity and of individual happiness. But as he was the chosen organ of Divine truth to man, on his moral and religious duties, it is most probable that what he expresses on other subjects, in those compositions which were to be the permanent guides of the opinions and conduct of his nation, will be also what is true and proper. It is most consistent with all that we know of intelligent agency, to suppose that he who was instructed or guided to be the lawgiver and sacred preceptor of his people, would be likewise so informed, or influenced, as to avoid falsehood on every collateral subject which it would be in the course of his narration to notice. If we were directing or assisting any pupil to write on any topic, we should certainly not suffer him to insert any thing that we knew to be a fiction or a fallacy. It is therefore most rational to suppose that the same precaution was used by the Deity towards his selected messenger. Hence, I am induced to believe that what Moses expresses incidentally on other points besides those of his divine legislation, is substantially true, and will be found to be so, as soon as his judges or readers have acquired competent knowledge. It is our deficiency in this which hurries us to discredit, or to doubt, or oppose him. But on no collateral point, additional to his main subject, was he more likely to have been correct, either from true human traditions of preceding knowledge, or communications, or from new supplementary aid, so far as that was needed, than in his notices of the divine creation. This was indeed the true basis of his mission and tuition; and it is brought prominently forward at once to our view, as if it were meant to be so. His brief intimations are, therefore, most probably the just outlines of all true geology; and thus far we may affirm, that the more our materials of judgment are increased by the multiplying labours of our geological students, the less founded any opposing speculations appear to become. It is now thirty-five years since my attention was first directed to these considerations. It was then the fashion for science, and for a large part of the educated and inquisitive world, to rush into a disbelief of all written revelation; and several geological speculations were directed against it. But I have lived to see the most hostile of these destroyed by their as hostile successors; and to observe that nothing which was of this character, however plausible at the moment of its appearance, has had any duration in human estimation, not even among the sceptical.

"Augmented knowledge has, from time to time, overthrown the erroneous reasonings with which the Mosaic account has been repeatedly assailed; and has actually brought to light more facts in its favour, than at this late period of the earth could have been expected to occur. Those which are of this description are enlarging

in number every year; and therefore my belief is, that the veracity of the chief Hebrew historian will be ultimately found to be as exact in what he has recorded in the cosmogony with which he commences his work, as it is in the account of his own legislation. There is certainly no appearance as yet that any contradictory theory will long survive its public enunciation. *Magna est* VERITAS, *et prevalebit*, is the everlasting axiom. Truth, and truth only, will obtain any immortality in the intellectual, and therefore in our literary and social world."—*Sharon Turner's Sacred History*, Vol. I. pp. 35—38.

Whether my feeble voice is to be heard or not on this great subject, here is one to which men of real science will be disposed to listen with some degree of deference and respect. I would not designedly suggest a word or thought, which would have a tendency to discourage the ardour of geological study. "The works of the Lord are great," and they should be "sought out by all that fear him." An extension of *true* knowledge must always be for the public good, and this cannot be without an enthusiastic pursuit of it. Let geology claim her full share of this. For one, with all my heart, I bid her *God speed!* All I ask or wish is, that she would not lay down positions before she is ready to demonstrate them;—that she would not call on us to believe this year deductions from certain supposed facts, which next year's examination will entirely overthrow;—that she would be more moderate in her course, and not go so far at a leap;—that she would be more patient in making out her final conclusions, and wait until the strata of all the continents are examined, at least as low as the alleged thickness of them in Europe;*—and, finally, that she would not force upon Moses, *nolens volens* the Hebrew text, the conclusions which she thinks herself entitled to draw from her own speculations. When she takes these new positions, I shall be one of the number who will most heartily applaud her efforts and rejoice in her success.

* This is supposed to be about ten miles.

HINTS

ON

EXTEMPORANEOUS PREACHING.

By HENRY WARE, Jun. D. D.

MINISTER OF THE SECOND CHURCH IN BOSTON, AND PROFESSOR OF PULPIT ELOQUENCE IN HARVARD UNIVERSITY.

Maximus vero studiorum fructus est, et velut præmium quoddam amplissimum longi laboris, *ex tempore dicendi facultas.*—

Quinct.

EDINBURGH:

THOMAS CLARK, 38, GEORGE STREET.

MDCCCXXXVI.

JNE

JAMES BURNET, PRINTER, 23, EAST THISTLE STREET.

PREFACE.

It is the object of this little work, to draw the attention of those who are preparing for the Christian ministry, or who have just entered it, to a mode of preaching which the writer thinks has been too much discountenanced and despised; but which, under proper restrictions, he is persuaded, may add greatly to the opportunities of ministerial usefulness. The subject has hardly received the attention it deserves from writers on the pastoral office, who have usually devoted to it but a few sentences, which offer little encouragement, and afford no aid. Burnet, in his Treatise on the Pastoral Care, and Fenelon in his Dialogues on Eloquence, have treated it more at large, but still very cursorily. To their arguments and their authority, which are of great weight, I refer the more distinctly here, because I have not quoted them so much at large as I intended when I wrote the beginning of the second chapter. Besides these, the remarks of Quinctilian, x. 7, on the subject of speaking extempore, which are full of his usual good sense, may be very profitably consulted.

It has been my object to state fully and fairly the advantages which attend this mode of address in the pulpit, and at the same time to guard against the dangers and abuses to which it is confessedly liable. How far I may have succeeded, it is not for me to determine. It would be something to persuade but one to add this to his other talents for doing good in the church. Even the attempt to do it, though unsuccessful, would not be without its reward; since it could not be fairly made without a most salutary, moral, and intellectual discipline.

It is not to be expected—nor do I mean by any thing I have said to intimate—that every man is capable of becoming an accomplished preacher in this mode, or that every one may succeed as well in this as in the ordinary mode. There is a variety in the talents of men, and to some this may be peculiarly unsuited. Yet this is no good reason why *any* should decline the attempt, since it is only by making the attempt that they can determine whether or not success is within their power.

There is at least one consequence likely to result from the study of this art, and the attempt to practise it, which would alone be a sufficient reason for urging it earnestly. I mean, its probable effect in breaking up the constrained, formal, scholastic mode of address, which follows the student from his college duties, and keeps him from immediate contact with the hearts of his fellow-men. This would be effected by his learning to speak from his feelings, rather than from the critical rules of a book. His address would be more natural, and consequently better adapted to effective preaching.

BOSTON, *January*, 1824.

ADVERTISEMENT

TO

THE SECOND EDITION.

UPON offering to the public another edition of this work, the author has only to say, that he has made a few alterations, which he hopes may render it more worthy of the indulgence it has received, and better fitted to answer the object for which it was designed.

February, 1826.

HINTS

ON

EXTEMPORANEOUS PREACHING.

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CHAPTER I.

ADVANTAGES OF EXTEMPORANEOUS PREACHING.

IT is a little remarkable, that while some classes of Christians do not tolerate the preaching of a written discourse, others have an equal prejudice against all sermons which have not been carefully precomposed. Among the latter are to be found those who favour an educated ministry, and whose preachers are valued for their cultivated minds and extensive knowledge. The former are, for the most part, those who disparage learning as a qualification for a Christian teacher, and whose ministers are consequently not accustomed to exact mental discipline, nor familiar with the best models of thinking and writing. It might seem at first view that the least cultivated would require the greatest previous preparation in order profitably to address their fellow-men; and that the best-informed, and most accustomed to study, might be best trusted to speak without the labour of written composition. That it has been thought otherwise, is probably owing, in a

great measure, to the solicitude for literary exactness and elegance of style, which becomes a habit in the taste of studious men, and renders all inaccuracy and carelessness offensive. He who has been accustomed to read and admire the finest models of composition in various languages, and to dwell on those niceties of method and expression which form so large a part of the charm of literary works, acquires a critical delicacy of taste, which renders him fastidiously sensitive to those crudities and roughnesses of speech, which almost necessarily attend an extemporaneous style. He is apt to exaggerate their importance, and to imagine that no excellencies of another kind can atone for them. He therefore protects himself by the toil of previous composition, and ventures not a sentence which he has not leisurely weighed and measured. An audience also, composed of reading people, or accustomed to the exactness of written composition in the pulpit, acquires something of the same taste, and is easily offended at the occasional homeliness of diction and looseness of method which occur in extemporaneous speaking. Whereas those preachers and hearers, whose education and habits of mind have been different, know nothing of this taste, and are insensible to these blemishes; and, if there be only a fluent outpouring of words, accompanied by a manner which evinces earnestness and sincerity, are pleased and satisfied.

It is further remarkable, that this prejudice of taste has been suffered to produce this effect in no profession but that of the ministry. The most fastidious taste never carries a written speech to the bar or into the senate. The very man who dares not ascend the pulpit without a sermon diligently arranged, and filled out to the smallest word, if he had gone into the profession of the law, would, at the same age, and with no greater advantages, address the bench and the jury in language altogether unpremeditated. Instances are not wanting in which the minister, who imagined it impossible to put ten sentences together in the pulpit, has found himself able, on changing his profession, to speak fluently for an hour.

I have no doubt that to speak extempore is easier at

the bar and in the legislature, than in the pulpit. Our associations with this place are of so sacred a character, that our faculties do not readily play there with their accustomed freedom. There is an awe upon our feelings which constrains us. A sense, too, of the importance and responsibility of the station, and of the momentous consequences depending on the influence he may there exert, has a tendency to oppress and embarrass the conscientious man, who feels it as he ought. There is also, in the other cases, an immediate end to be attained, which produces a powerful immediate excitement—an excitement, increased by the presence of those who are speaking on the opposite side of the question, and in assailing or answering whom, the embarrassment of the place is lost in the interest of the argument. Whereas in the pulpit, there is none to assault, and none to refute, —the preacher has the field entirely to himself, and this is sufficiently dismaying. The ardour and self-oblivion which present debate occasions do not exist; and the solemn stillness and fixed gaze of a waiting multitude, serve rather to appal and abash the solitary speaker, than to bring the subject forcibly to his mind, or cause his attention to be absorbed in it. Thus every external circumstance is unpropitious, and it is not strange that relief has been sought in the use of manuscripts.

But still, these difficulties, and others which I shall have occasion to mention in another place, are by no means such as to raise that insuperable obstacle which many suppose. They may all be overcome by resolution and perseverance. As regards merely the use of unpremeditated language, it is far from being a difficult attainment. A writer, whose opportunities of observation give weight to his opinion, says, in speaking of the style of the younger Pitt—"This profuse and interminable flow of words is not in itself either a rare or remarkable endowment. It is wholly a thing of habit, and is exercised by every village lawyer with various degrees of power and grace."* If there be circumstances which render the

* Europe, &c. by a Citizen of the United States.

habit more difficult to be acquired by the preacher, they are still such as may be surmounted; and it may be made plain, I think, that the advantages which he may thus ensure to himself are so many and so great, as to offer the strongest inducement to make the attempt.

That these advantages are real and substantial, may be safely inferred from the habit of public orators in other professions, and from the effects which they are known to produce. There is more natural warmth in the declamation, more earnestness in the address, greater animation in the manner, more of the lighting up of the soul in the countenance and whole mien, more freedom and meaning in the gesture; the eye speaks, and the fingers speak, and when the orator is so excited as to forget every thing but the matter on which his mind and feelings are acting, the whole body is affected, and helps to propagate his emotions to the hearer. Amidst all the exaggerated colouring of Patrick Henry's biographer, there is doubtless enough that is true, to prove a power in the spontaneous energy of an excited speaker, superior in its effects to any thing that can be produced by writing. Something of the same sort has been witnessed by every one who is in the habit of attending in the courts of justice, or the chambers of legislation. And this, not only in the instances of the most highly eloquent; but inferior men are found thus to excite attention and produce effects, which they never could have done by their pens. In deliberative assemblies, in senates and parliaments, the larger portion of the speaking is necessarily unpremeditated; perhaps the most eloquent is always so; for it is elicited by the growing heat of debate; it is the spontaneous combustion of the mind in the conflict of opinion. Chatham's speeches were not written, nor those of Fox, nor that of Ames on the British treaty. They were, so far as regards their language and ornaments, the effusions of the moment, and derived from their freshness a power which no study could impart. Among the orations of Cicero, which are said to have made the greatest impression, and to have best accomplished the orator's design, are those delivered on unexpected emergencies, which precluded the possibility

of previous preparation. Such were his first invective against Cataline, and the speech which stilled the disturbances at the theatre. In all these cases, there can be no question of the advantage which the orators enjoyed in their ability to make use of the excitement of the occasion, unchilled by the formality of studied preparation. Although possibly guilty of many rhetorical and logical faults, yet these would be unobserved in the fervent and impassioned torrent, which bore away the minds of the delighted auditors.

It is doubtless very true, that a man of study and reflection, accustomed deliberately to weigh every expression and analyze every sentence, and to be influenced by nothing which does not bear the test of the severest examination, may be most impressed by the quiet, unpretending reading of a well-digested essay or dissertation. To some men the concisest statement of a subject, with nothing to adorn the naked skeleton of thought, is most forcible. They are even impatient of any attempt to assist its effect by fine writing, by emphasis, tone, or gesture. They are like the mathematician, who read the Paradise Lost without pleasure, because he could not see that it proved any thing. But we are not to judge from the taste of such men, of what is suitable to affect the majority. The multitude are not mere thinkers or great readers. From their necessary habits they are incapable of following a long discussion, except it be made inviting by the circumstances attending it, or the manner of conducting it. Their attention must be roused and maintained by some external application. To them,

> Action is eloquence, and the eyes of the ignorant
> More learned than their ears.

It is a great fault with intellectual men, that they do not make sufficient allowance for the different modes of education and habits of mind in men of other pursuits. It is one of the infelicities of education at a university, that a man is there trained in a fictitious scene, where there are interests, associations, feelings, exceedingly diverse from what prevail in the society of the world; and

where he becomes so far separated from the habits and sympathies of other men, as to need to acquire a new knowledge of them, before he knows how to address them. When a young man leaves the seclusion of a student's life to preach to his fellow-men, he is likely to speak to them as if they were scholars. He imagines them to be capable of appreciating the niceties of method and style, and of being affected by the same sort of sentiment, illustration, and cool remark, which affects those who have been accustomed to be guided by the dumb and lifeless pages of a book. He therefore talks to them calmly, is more anxious for correctness than impression, fears to make more noise or to have more motion than the very letters on his manuscript; addressing himself, as he thinks, to the intellectual part of man; but he forgets that the intellectual man is not very easy of access, and must be approached through the senses and affections and imagination.

There was a class of rhetoricians and orators at Rome in the time of Cicero, who were famous for having made the same mistake. They would do every thing by a fixed and almost mechanical rule, by calculation and measurement. Their sentences were measured, their gestures were measured, their tones were measured; and they framed canons of judgment and taste, by which it was pronounced an affront on the intellectual nature of man to assail him with epithets, and exclamations, and varied tones, and emphatic gesture. They censured the free and flowing manner of Cicero as "tumid and exuberant," *nec satis pressus, supra modum exultans et superfluens.* They cultivated a more guarded and concise style, which might indeed please the critic or the scholar, but was wholly unfitted to instruct or move a promiscuous audience; as was said of one of them, *oratio—doctis et attente audientibus erat illustris; a multitudine autem et a foro, cui nata eloquentia est, devorabatur.* The taste of the multitude prevailed, and Cicero was the admiration of the people, while those who pruned themselves by a more rigid and philosophical law,

Coldly correct and critically dull,

" were frequently deserted by the audience in the midst of their harangues."*

We may learn something from this. There is one mode of address for books and for classical readers, and another for the mass of men, who judge by the eye and ear, by the fancy and feelings, and know little of rules of art, or of an educated taste. Hence it is that many of those preachers who have become the classics of a country have been unattractive to the multitude, who have deserted their polished and careful composition for the more unrestrained and rousing declamation of another class. The singular success of Chalmers seems to be in a considerable measure owing to his attention to this fact. He has abandoned the pure and measured style, and adopted a heterogeneous mixture of the gaudy, pompous and colloquial, offensive to the ears of literary men, but highly acceptable to those who are less biassed by the authority of a standard taste and established models. We need not go to the extreme of Chalmers—for there is no necessity for inaccuracy, bombast, or false taste—but we should doubtless gain by adopting his principle. The object is to address men according to their actual character, and in that mode in which their habits of mind may render them most accessible. As but few are thinkers or readers, a congregation is not to be addressed as such; but, their modes of life being remembered, constant regard must be had to their need of external attraction. This is most easily done by the familiarity and directness of extemporaneous address; for which reason this mode of preaching has peculiar advantages, in its adaptation to their situation and wants.

The truth is, indeed, that it is not the weight of the thought, the profoundness of the argument, the exactness of the arrangement, the choiceness of the language, which interest and chain the attention of even those educated hearers who are able to appreciate them all. They are as likely to sleep through the whole as others. They can find all these qualities in much higher perfection in

* Middleton's Life of Cicero, iii. 324.

their libraries; they do not seek these only at church. And as to the large mass of the people, they are to them hidden things, of which they discern nothing. It is not these, so much as the attraction of an earnest manner, which arrests the attention and makes instruction welcome. Every day's observation may show us, that he who has this manner will retain the attention of even an intellectual man with common-place thoughts, while, with a different manner, he would render tedious the most novel and ingenious disquisitions. Let an indifferent reader take into the pulpit a sermon of Barrow or Butler, and all its excellence of argument and eloquence would not save it from being accounted tedious; while an empty declaimer shall collect crowds to hang upon his lips in raptures. And this manner, which is so attractive, is not the studied artificial enunciation of the rhetorician's school, but the free, flowing, animated utterance, which seems to come from the impulse of the subject; which may be full of faults, yet masters the attention by its nature and sincerity. This is precisely the manner of the extemporaneous speaker—in whom the countenance reflects the emotions of the soul, and the tone of voice is tuned to the feelings of the heart, rising and falling with the subject, as in conversation, without the regular and harmonious modulation of the practised reader.

In making these and similar remarks, it is true that I am thinking of the *best* extemporaneous speakers, and that all cannot be such. But it ought to be recollected at the same time, that all cannot be excellent *readers;* that those who speak ill, would probably read still worse; and that therefore those who can attain to no eminence as speakers, do not on that account fail of the advantages of which I speak, since they escape at least the unnatural monotony of bad reading; than which nothing is more earnestly to be avoided.

Every man utters himself with greater animation and truer emphasis in speaking, than he does, or perhaps can do, in reading. Hence it happens that we can listen longer to a tolerable speaker, than to a good reader. There is an indescribable something in the natural tones

of him who is expressing earnestly his present thoughts, altogether foreign from the drowsy uniformity of the man that reads. I once heard it well observed, that the least animated mode of communicating thoughts to others, is the reading from a book the composition of another; the next in order is the reading one's own composition; the next is delivering one's own composition *memoriter;* and the most animated of all is the uttering one's own thoughts as they rise fresh in his mind. Very few can give the spirit to another's writings which they communicate to their own, or can read their own with the spirit with which they spontaneously express themselves. We have all witnessed this in conversation, when we have listened with interest to long harangues from persons who tire us at once if they begin to read. It is verified at the bar, and in the legislature, where orators maintain the unflagging attention of hearers for a long period, when they could not have read the same speech without producing intolerable fatigue. It is equally verified in the history of the pulpit; for those who are accustomed to the reading of sermons, are for the most part impatient, even of able discourses, when they extend beyond the half hour's length; while very indifferent extemporaneous preachers are listened to with unabated attention for a full hour. In the former case there is a certain uniformity of tone, and a perpetual recurrence of the same cadences, inseparable from the manner of a reader, from which the speaker remains longer free. This difference is perfectly well understood, and was acted upon by Cecil, whose success as a preacher gives him a right to be heard, when he advised young preachers to "limit a written sermon to half an hour, and one from notes to forty minutes."* For the same reason, those preachers whose reading comes nearest to speaking, are universally more interesting than others.

Thus it is evident that there is an attractiveness in this mode of preaching, which gives it peculiar advantages. He imparts greater interest to what he says, who is go-

* Cecil's Remains—a delightful little book.

verned by the impulse of the moment, than he who speaks by rule. When he feels the subject, his voice and gesture correspond to that feeling, and communicate it to others, as it can be done in no other way. Though he possess but indifferent talents, yet if he utter himself with sincerity and feeling, it is far pleasanter than to listen to his cold reading of what he wrote perhaps with little excitement, and delivers with less.

In thus speaking of the interest which attends an extemporaneous delivery, it is not necessary to pursue the subject into a general comparison of the advantages of this mode with those of reading and of reciting from memory. Each has prevailed in different places and at different periods, and each undoubtedly has advantages and disadvantages peculiar to itself. These are well, though briefly stated in the excellent article on Elocution in Rees's Cyclopædia, to which it will be sufficient to refer, as worthy attentive perusal. The question at large I cannot undertake to discuss. If I should, I could hardly hope to satisfy either others or myself. The almost universal custom of reading in this part of the world, where recitation from memory is scarcely known, and extemporaneous speaking is practised by very few except the illiterate, forbids any thing like a fair deduction from observation. In order to institute a just comparison, one should have had extensive opportunities of watching the success of each mode, and of knowing the circumstances under which each was tried. For in the inquiry which is to be preferred in the pulpit,—we must consider, not which has most excellencies when it is found in perfection, but which has excellencies attainable by the largest number of preachers; not which is first in theory or most beautiful as an art, but which has been and is likely to be most successful in practice. These are questions not easily answered. Each mode has its advocates and its opponents. In the English church there is nothing but reading, and we hear from every quarter complaints of it. In Scotland the custom of recitation prevails, but multitudes besides Dr. Campbell* condemn it. In many

* See his fourth Lecture on Pulpit Eloquence.

parts of the continent of Europe no method is known, but that of a brief preparation and unpremeditated language; but that it should be universally approved by those who use it, is more than we can suppose.

The truth is, that either method may fail in the hands of incompetent or indolent men, and either may be thought to succeed by those whose taste or prejudices are obstinate in its favour. All that I contend for, in advocating unwritten discourse, is, that this method claims a decided superiority over the others in some of the most important particulars. That the others have their own advantages, I do not deny, nor that this is subject to disadvantages from which they are free. But whatever these may be, I hope to show that they are susceptible of a remedy; that they are not greater than those which attend other modes; that they are balanced by equal advantages; and that therefore this art deserves to be cultivated by all who would do their utmost to render their ministry useful. There can be no good reason why the preacher should confine himself to either mode. It might be most beneficial to cultivate and practise all. By this means he might impart something of the advantages of each to each, and correct the faults of all by mingling them with the excellencies of all. He would learn to read with more of the natural accent of the speaker, and to speak with more of the precision of the writer.

The remarks already made have been designed to point out some of the general advantages attending the use of unprepared language. Some others remain to be noticed, which have more particular reference to the preacher individually.

It is no unimportant consideration to a minister of the Gospel, that this is a talent held in high estimation among men, and that it gives additional influence to him who possesses it. It is thought to argue capacity and greatness of mind. Fluency of language passes with many, and those not always the vulgar, for affluence of thought; and never to be at a loss for something to say, is supposed to indicate inexhaustible knowledge. It cannot

have escaped the observation of any one accustomed to notice the judgments which are passed upon men, how much reputation and consequent influence are acquired by the power of speaking readily and boldly, without any other considerable talent, and with very indifferent acquisitions; and how a man of real talents, learning, and worth has frequently sunk below his proper level, from a mere awkwardness and embarrassment in speaking without preparation. So that it is not simply superstition which leads so many to refuse the name of preaching to all but extemporaneous harangues; it is in part owing to the natural propensity there is to admire, as something wonderful and extraordinary, this facility of speech. It is undoubtedly a very erroneous standard of judgment. But a minister of the Gospel, whose success in his important calling depends so much on his personal influence, and the estimation in which his gifts are held, can hardly be justified in slighting the cultivation of a talent which may so innocently add to his means of influence.

It must be remembered also, that occasions will sometimes occur, when the want of this power may expose him to mortification, and deprive him of an opportunity of usefulness. For such emergencies one would choose to be prepared. It may be of consequence that he should express his opinion in an ecclesiastical council, and give reasons for the adoption or rejection of important measures. Possibly he may be only required to state facts which have come to his knowledge. It is very desirable to be able to do this readily, fluently, without embarrassment to himself, and pleasantly to those who hear; and in order to this, a habit of speaking is necessary. In the course of his ministrations amongst his own people, occasions will arise when an exhortation or address would be seasonable and useful, but when there is no time for written preparation. If then he have cultivated the art of extemporaneous speaking, and attained to any degree of facility and confidence in it, he may avail himself of the opportunity to do good, which he must otherwise have passed by unimproved. Funerals and baptisms afford suitable occasions of making good religious impressions.

A sudden providence, also, on the very day of the Sabbath, may suggest most valuable topics of reflection and exhortation, lost to him who is confined to what he may have previously written, but choice treasure to him who can venture to speak without writing. If it were only to avail himself of a few opportunities like these in the course of his life, or to save himself but once the mortification of being silent when he ought to speak, is expected to speak, and would do good by speaking, it would be well worth all the time and pains it might cost to acquire it.

It is a further advantage, not to be forgotten here, that the excitement of speaking in public strikes out new views of a subject, new illustrations, and unthought of figures and arguments, which perhaps never would have presented themselves to the mind in retirement. "The warmth which animates him," says Fenelon, "gives birth to expressions and figures, which he never could have prepared in his study." He who feels himself safe in flying off from the path he has prescribed to himself, without any fear lest he should fail to find his way back, will readily seize upon these, and be astonished at the new light which breaks in upon him as he goes on, and flashes all around him. This is according to the experience of all extemporaneous speakers. "The degree in which," says Thomas Scott,* who practised this method constantly, "after the most careful preparation for the pulpit, new thoughts, new arguments, animated addresses, often flow into my mind, while speaking to a congregation, even on very common subjects, makes me feel as if I was quite another man than when poring over them in my study. There will be inaccuracies; but generally the most striking things in my sermons were unpremeditated."

Then again, the presence of the audience gives a greater seeming reality to the work; it is less like doing a task, and more like speaking to men, than when one sits coolly writing at his table. Consequently there is likely to be greater plainness and directness in his exhor-

* Life, p. 268.

tations—more closeness in his appeals—more of the earnestness of genuine feeling in his expostulations. He ventures, in the warmth of the moment, to urge considerations, which perhaps in the study seemed too familiar, and to employ modes of address, which are allowable in personal communion with a friend, but which one hesitates to commit to writing, lest he should infringe the dignity of deliberate composition. This forgetfulness of self—this unconstrained following the impulse of the affections, while he is hurried on by the presence and attention of those whom he hopes to benefit, creates a sympathy between him and his hearers—a direct passage from heart to heart—a mutual understanding of each other, which does more to effect the true object of religious discourse, than any thing else can do. The preacher will, in this way, have the boldness to say many things which ought to be said, but about which, in his study, he would feel reluctant and timid. And granting that he might be led to say some things improperly, yet if his mind be well disciplined and well governed, and his discretion habitual, he will do it exceedingly seldom; while no one, who estimates the object of preaching as highly as he should, will think an occasional false step any objection against that mode, which insures upon the whole the greatest boldness and earnestness. He will think it a less fault than the tameness and abstractness, which are the besetting sins of deliberate composition. At any rate, what method is secure from occasional false steps?

Another consideration which recommends this method to the attention of preachers, though at the same time it indicates one of its difficulties, is this—that all men, from various causes, constitutional or accidental, are subject to great inequality in the operations of their minds—sometimes labouring with felicity, and sometimes failing. Perhaps this fact is in no men so observable as in preachers, because no others are so much compelled to labour, and exhibit their labours, at all seasons, favourable and unfavourable. There is a certain quantity of the severest mental toil to be performed every week; and as the mind

cannot be always in the same frame, they are constantly presenting proofs of the variation of their powers. An extemporaneous speaker is of course exposed to all this inequality, and must expect to be sometimes mortified by ill success. When the moment of speaking arrives, his mind may be slow and dull, his thoughts sluggish and impeded: he may be exhausted by labour, or suffering from temporary indisposition. He strives in vain to rally his powers, and forces his way, with thorough discomfort and chagrin, to the end of an unprofitable talk. But then how many men *write* under the same embarrassments, and are equally dissatisfied,—with the additional mortification of having spent a longer time, and of being unable to give their poor preparation the interest of a forcible manner, which the very distress of an extemporaneous effort would have imparted.

But on the other hand, when his mind is bright and clear, and his animal spirits lively, he will speak much better after merely a suitable premeditation, than he can possibly write. "Every man," says Bishop Burnet, "may thus rise far above what he could ever have attained in any other way." We see proof of this in conversation. When engaged in unrestrained and animated conversation with familiar friends, who is not conscious of having struck out brighter thoughts and happier sayings, than he ever put upon paper in the deliberate composition of the closet? It is a common remark concerning many men, that they pray much better than they preach. The reason is, that their sermons are made leisurely and sluggishly, without excitement; but in their public devotions, they are strongly engaged, and the mind acts with more concentration and vivacity. The same thing has been observed in the art of music. "There have been organists, whose abilities in unstudied effusions on their instruments have almost amounted to inspiration, such as Sebastian, Bach, Handel, Marchand, Couperin, Kelway, Stanley, Worgan, and Keeble,—several of whom played better music extempore than they could write with meditation."*

* Rees's Cyclopædia.

It is upon no different principle that we explain, what all scholars have experienced, that they write best when they write rapidly, from a full and excited mind. One of Roscommon's precepts is—"To write with fury and correct with phlegm." The author of Waverley tells us, "that the works and passages in which he has succeeded, have uniformly been written with the greatest rapidity." Johnson's best Ramblers and his admirable Rasselas were hurried wet and uncorrected to the press. The celebrated Rockingham Memorial at the commencement of the late war, is said to have been the hasty composition of a single evening. And it will be found true, I believe, of many of the best sermon writers, that they revolve the subject till their minds are filled and warmed, and then put their discourse upon paper at a single sitting. Now what is all this but *extemporaneous writing?* and what does it require but a mind equally collected and at ease, equally disciplined by practice, and interested in the subject, to ensure equal success in *extemporaneous speaking?* Nay, we might anticipate occasional superior success; since the thoughts sometimes flow, when at the highest and most passionate excitement, too rapidly and profusely for any thing slower than the tongue to afford them vent.

There is one more consideration in favour of the practice I recommend, which I think cannot fail to have weight with all who are solicitous to make progress in theological knowledge,—namely, that it redeems time for study. The labour of preparing and committing to paper a sermon or two every week, is one which necessarily occupies the principal part of a minister's time and thoughts, and withdraws him from the investigation of many subjects, which, if his mind were more at leisure, it would be his duty and pleasure to pursue. He who *writes* sermons, is ready to consider this as the chief object, or perhaps the sole business of his calling. When not actually engaged in writing, yet the necessity of doing it presses upon his mind, and so binds him as to make him feel as if he were wrong in being employed on any thing else. I speak of the tendency, which certainly

is to prevent a man from pursuing, very extensively, any profitable study. But if he have acquired that ready command of thought and language, which will enable him to speak without written preparation, the time and toil of writing are saved, to be devoted to a different mode of study. He may prepare his discourses at intervals of leisure, while walking or riding; and having once arranged the outlines of the subject, and ascertained its principal bearings and applications, the work of preparation is over. The language remains to be suggested at the moment.

I do not mean by this that preparation for the pulpit should ever be made slightly, or esteemed an object of small importance. It doubtless demands, and should receive, the best of a man's talents and labours. What I contend for is, that a habit of mind may be acquired, which shall enable one to make a better and more thorough preparation, at less expense of labour and time. He may acquire, by discipline, that ease and promptitude of looking into subjects, and bringing out their prominent features, which shall enable him at a glance, as it were, to seize the points on which he should enlarge. Some minds are so constituted as "to look a subject into shape" much more readily than others. But the power of doing it is in a great measure mechanical, and depends upon habit. All may acquire it to a certain extent. When the mind works with most concentration, it works at once most quickly and most surely. Now the act of speaking extempore favours this concentration of the powers, more than the slower process of leisurely writing —perhaps more than any other operation; consequently it increases, with practice, the facility of dissecting subjects, and of arranging materials for preaching. In other words, the completeness with which a subject is viewed and its parts arranged, does not depend so much on the time spent upon it, as on the vigour with which the attention is applied to it. That course of study is the best, which most favours this vigour of attention; and the habit of extemporaneous speaking is more than any thing favour-

able to it, from the necessity which it imposes of applying the mind with energy, and thinking promptly.

The great danger in this case would be, that of substituting an easy flow of words for good sense and sober reflection, and becoming satisfied with very superficial thoughts. But this danger is guarded against by the habit of study, and of writing for other purposes. If a man should neglect all mental exertion, except so far as would be required in the meditation of a sermon, it would be ruinous. We witness its disastrous effects in the empty wordiness of many extemporaneous preachers. It is wrong, however, to argue against the practice itself, from their example; for all other modes would be equally condemned, if judged by the ill success of indolent and unfaithful men. The minister must keep himself occupied, reading, thinking, investigating—thus having his mind always awake and active. This is a far better preparation than the bare writing of sermons, for it exercises the powers more, and keeps them bright. The great master of Roman eloquence thought it essential to the true orator that he should be familiar with all sciences, and have his mind filled with every variety of knowledge. He therefore, much as he studied his favourite art, yet occupied more time in literature, philosophy, and politics, than in the composition of his speeches. His preparation was less particular than general. So it has been with other eminent speakers. When Sir Samuel Romilly was in full practice in the High Court of Chancery, and at the same time overwhelmed with the pressure of public political concerns, his custom was to enter the court to receive there the history of the cause he was to plead—thus to acquaint himself with the circumstances for the first time, and forthwith proceed to argue it. His general preparation and long practice enabled him to do this, without failing in justice to his cause. I do not know that in this he was singular. The same sort of preparation would ensure success in the pulpit. He who is always thinking, may expend upon each individual effort less time, because he can think at once fast and well. But he who never thinks, except when attempting to

manufacture a sermon, (and it is to be feared there are such men,) must devote a great deal of time to this labour exclusively; and, after all, he will not have that wide range of thought or copiousness of illustration, which his office demands, and which study only can give.

In fact, what I have here insisted upon, is exemplified in the case of the extemporaneous *writers* whom I have already named. I would only carry their practice a step further, and devote an hour to a discourse instead of a day. Not to all discourses, for some ought to be written for the sake of writing, and some demand a sort of investigation, to which the use of the pen is essential. But then a very large proportion of the topics on which a minister should preach, have been subjects of his attention a thousand times. He is thoroughly familiar with them; and an hour to arrange his ideas and collect illustrations is abundantly sufficient. The late Thomas Scott is said for years to have prepared his discourses entirely by meditation on the Sunday, and thus to have gained leisure for his extensive studies, and great and various labours. This is an extreme on which few have a right to venture, and which should be recommended to none. It shows, however, the power of habit, and the ability of a mind to act promptly and effectually, which is kept upon the alert by constant occupation. He who is always engaged in thinking and studying, will always have thoughts enough for a sermon, and good ones too, which will come at an hour's warning.

The objections which may be made to the practice I have sought to recommend, I must leave to be considered in another place. I am desirous, in concluding this chapter, to add the favourable testimony of a writer, who expressly disapproves the practice in general, but who allows its excellence when accompanied by that preparation which I would everywhere imply:—

"You are accustomed," says Dinouart,* "to the careful study and imitation of nature. You have used yourself to writing and speaking with care on different subjects,

* Sur l'Eloquence du Corps, ou l'Action du Prédicateur.

and have well stored your memory by reading. You thus have provided resources for speaking, which are always at hand. The best authors and the best thoughts are familiar to you. You can readily quote the Scriptures—you express yourself easily and gracefully—you have a sound and correct judgment on which you can depend, method and precision in the arrangement of proofs—you can readily connect each part by natural transitions, and are able to say all that belongs, and precisely what belongs, to the subject. You may then take only a day, or only an hour, to reflect on your subject, to arrange your topics, to consult your memory, to choose and to prepare your illustrations—and then, appear in public. I am perfectly willing that you should. The common expressions which go to make up the body of the discourse will present themselves spontaneously. Your periods, perhaps, will be less harmonious, your transitions less ingenious, an ill-placed word will sometimes escape you; but all this is pardonable. The animation of your delivery will compensate for these blemishes, and you will be master of your own feelings and those of your hearers. There will, perhaps, be apparent throughout a certain disorder, but it will not prevent your pleasing and affecting me,—your action, as well as your words, will appear to me the more natural."

CHAPTER II.

DISADVANTAGES OF EXTEMPORANEOUS PREACHING—OBJECTIONS CONSIDERED.

Against what has been advanced in the preceding pages, many objections will be urged, and the evils of the practice I recommend be declared more than sufficient to counterbalance its advantages. Of these it is necessary that I should now take notice, and obviate them as well as I may.

It should be first of all remarked, that the force of the objections commonly made, lies against the exclusive use

of extempore preaching, and not against its partial and occasional use. It is of consequence that this should be considered. There can be no doubt, that he would preach very wretchedly, who should always be haranguing without the corrective discipline of writing. The habit of writing is essential. Many of the objections which are currently made to this mode of address, fall to the ground when this statement is made.

Other objections have been founded on the idea, that by *extemporaneous* is meant *unpremeditated*. Whereas there is a plain and important distinction between them, the latter word being applied to the thoughts, and the former to the language only. To preach without premeditation is altogether unjustifiable; although there is no doubt that a man of habitual readiness of mind, may express himself to great advantage on a subject with which he is familiar, after very little meditation.

Many writers on the art of preaching, as well as on eloquence in general, have given a decided judgment unfavourable to extemporaneous speaking. There can be no fairer way of answering their objections, than by examining what they have advanced, and opposing their authority by that of equal names on the other side.

Gerard, in his Treatise on the Pastoral Charge, has the following passage on this subject.

"He will run into trite, common-place topics; his compositions will be loose and unconnected; his language often coarse and confused; and diffidence, or care to recollect his subject, will destroy the management of his voice." At the same time, however, he admits that "it is very proper that a man should be able to preach in this way, when it is necessary;—but no man ought always to preach in this way." To which decision I have certainly nothing to object.

Mason, in his Student and Pastor, says to the same effect, that "the inaccuracy of diction, the inelegance, poverty, and lowness of expression, which is commonly observed in extempore discourses, will not fail to offend every hearer of good taste."

Dinouart, who is an advocate for recitation from me-

mory, says that " experience decides against extemporaneous preaching, though there are exceptions; but these are very few; and we must not be led astray by the success of a few first-rate orators."

Hume, in his Essay upon Eloquence, expresses an opinion that the modern deficiency in this art is to be attributed to " that extreme affectation of extempore speaking, which has led to extreme carelessness of method."

The writer of an article, on the Greek Orators, in the Edinburgh Review,* observes, that " among the sources of the corruption of modern eloquence, may clearly be distinguished as the most fruitful, the habit of extempore speaking, acquired rapidly by persons who frequent popular assemblies, and, beginning at the wrong end, attempt to speak before they have studied the art of oratory, or even duly stored their minds with the treasures of thought and language, which can only be drawn from assiduous intercourse with the ancient and modern classics."

These are the prominent objections which have been made to the practice in question. Without denying that they have weight, I think it may be made to appear that they have not the unquestionable preponderance, which is assumed for them. They will be found, on examination, to be the objections of a cultivated taste, and to be drawn from the examples of undisciplined men, who ought to be left entirely out of the question.

1. The objection most urged is that which relates to style. It is said, the expression will be poor, inelegant, inaccurate, and offensive to hearers of taste.

To those who urge this, it may be replied, that the reason why style is an important consideration in the pulpit, is not that the taste of the hearers may be gratified, for but a small part of any congregation is capable of taking cognizance of this matter;—but solely for the purpose of presenting the speaker's thoughts, reasonings, and expostulations distinctly and forcibly to the minds of his hearers. If this be effected, it is all which can rea-

* No. LXXI. p. 82.

sonably be demanded. And I ask if it be not notorious, that an earnest and appropriate elocution will give this effect to a poor style, and that poor speaking will take it away from the most exact and emphatic style? Is it not also notorious, that the peculiar earnestness of spontaneous speech, is, above all others, suited to arrest the attention, and engage the feelings of an audience? and that the mere reading of a piece of fine composition, under the notion that careful thought and finished diction are the only things needful, leaves the majority uninterested in the discourse, and free to think of any thing they please? "It is a poor compliment," says Blair, "that one is an accurate reasoner, if he be not a persuasive speaker also." It is a small matter that the style is poor, so long as it answers the great purpose of instructing and affecting men. So that, as I have more fully shown in a former place, the objection lies on an erroneous foundation.

Besides, if it were not so, it will be found quite as strong against the *writing* of sermons. For how large a proportion of sermon writers have these same faults of style! what a great want of force, neatness, compactness, is there in the composition of most preachers! what weakness, inelegance, and inconclusiveness! and how small improvement do they make, even after the practice of years! How happens this? It is because they do not make this an object of attention and study; and some might be unable to attain it if they did. But that watchfulness and care which secure a correct and neat style in writing, would also secure it in speaking. It does not naturally belong to the one more than to the other, and may be as certainly attained in each by the proper pains. Indeed so far as my observation has extended, I am not certain that there is not as large a proportion of extempore speakers, whose diction is exact and unexceptionable, as of writers;—always taking into view their education, which equally affects the one and the other. And it is a consideration of great weight, that the faults in question are far less offensive in speakers than in writers.

It is apparent that objectors of this sort are guilty of a double mistake; first, in laying too great stress upon mere defects of style, and then in taking for granted, that these are unavoidable. They might as well insist that defects of written style are unavoidable. Whereas they are the consequence of the negligent mode in which the art has been studied, and of its having been given up, for the most part, to ignorant and fanatical pretenders. Let it be diligently cultivated by educated men, and we shall find no more cause to expel it from the pulpit than from the forum or the parliament. "Poverty, inelegance, and poorness of diction" will be no longer so "generally observed," and even hearers of taste will cease to be offended.

2. A want of order, a rambling, unconnected, desultory manner, is commonly objected; as Hume styles it, "extreme carelessness of method;" and this is so often observed, as to be justly an object of dread. But this is occasioned by that indolence and want of discipline to which we have just alluded. It is not a necessary evil. If a man have never studied the art of speaking, nor passed through a course of preparatory discipline; if he have so rash and unjustifiable a confidence in himself, that he will undertake to speak, without having considered what he shall say, what object he shall aim at, or by what steps he shall attain it; the inevitable consequence will be confusion, inconclusiveness, and wandering. Who recommends such a course? But he who has first trained himself to the work, and whenever he would speak, has surveyed his ground, and become familiar with the points to be dwelt upon, and the course of reasoning and track of thought to be followed; will go on from one step to another, in an easy and natural order, and give no occasion to the complaint of confusion or disarrangement.

"Some preachers," says Dinouart, "have the folly to think that they can make sermons impromptu. And what a piece of work they make! They bolt out every thing which comes into their head. They take for granted what ought to be proved, or perhaps they state

half the argument, and forget the rest. Their appearance corresponds to the state of their mind, which is occupied in hunting after some way of finishing the sentence they have begun. They repeat themselves: they wander off in digression. They stand stiff without moving; or if they are of a lively temperament, they are full of the most turbulent action; their eyes and hands are flying about in every direction, and their words choke in their throats. They are like men swimming who have got frightened, and throw about their hands and feet at random to save themselves from drowning."

There is doubtless great truth in this humorous description. But what is the legitimate inference? that extemporaneous speaking is altogether ridiculous and mischievous? or only that it is an art which requires study and discipline, and which no man should presume to practise, until he has fitted himself for it?

3. In the same way I should dispose of the objection, that this habit leads to barrenness in preaching, and the everlasting repetition of the same sentiments and topics. If a man make his facility of speech an excuse for the neglect of study, then doubtless this will be the result. He who cannot resist his indolent propensities, had best avoid this occasion of temptation. He must be able to command himself to think, and industriously prepare himself by meditation, if he would be safe in this hazardous experiment. He who does this and continues to learn and reflect while he preaches, will be no more empty and monotonous than if he carefully wrote every word.

4. But this temptation to indolence in the preparation for the desk, is urged as in itself a decisive objection. A man finds that after a little practice, it is an exceedingly easy thing to fill up his half-hour with declamation which shall pass off very well, and hence he grows negligent in previous meditation; and insensibly degenerates into an empty exhorter, without choice of language, or variety of ideas. This is undoubtedly the great and alarming danger of this practice. This must be triumphed over, or it is ruinous. We see examples of it wherever we look among those whose preaching is exclusively extempore.

In these cases, the evil rises to its magnitude in consequence of their total neglect of the pen. The habit of writing a certain proportion of the time would, in some measure, counteract this dangerous tendency.

But it is still insisted, that man's natural love of ease is not to be trusted; that he will not long continue the drudgery of writing in part; that when he has once gained confidence to speak without study, he will find it so flattering to his indolence, that he will involuntarily give himself up to it, and relinquish the pen altogether; that consequently there is no security, except in never beginning.

To this it may be replied, that they who have not principle and self-government enough to keep them industrious, will not be kept so by being compelled to write sermons. I think we have abundant proof, that a man may write with as little pains and thinking, as he can speak. It by no means follows, that because it is on paper, it is therefore the result of study. And if it be not, it will be greatly inferior in point of effect to an unpremeditated declamation; for in the latter case, there will probably be at least a temporary excitement of feeling, and consequent vivacity of manner, while in the former the indolence of the writer will be made doubly intolerable by his heaviness in reading.

It cannot be doubted, however, that if any one find his facility of extemporaneous invention likely to prove destructive to his habits of diligent application, it were advisable that he refrain from the practice. It could not be worth while for him to lose his habits of study and thinking for the sake of an ability to speak, which would avail him but little, after his ability to think has been weakened or destroyed.

As for those whose indolence habitually prevails over principle, and who make no preparation for duty excepting the mechanical one of covering over a certain number of pages,—they have no concern in the ministry, and should be driven to seek some other employment, where their mechanical labour may provide them a livelihood, without injuring their own souls or those of other men.

If the objection in question be applied to conscientious

men, whose hearts are in their profession, and who have a sincere desire to do good, it certainly has very little weight. The minds of such men are kept active with reflection, and stored with knowledge, and warm with religious feeling. They are therefore always ready to speak to the purpose, as well as write to the purpose; and their habitual sense of the importance of their office, and their anxiety to fulfil it in the best manner, will forbid that indolence which is so disastrous. The objection implies that the consequence pointed out is one which cannot be avoided. Experience teaches us the contrary. It is the tendency; but a tendency which may be, for it has been, counteracted. Many have preached in this mode for years, and yet have never relaxed their diligence in study, nor declined in the variety, vigour, and interest of their discourses,—sometimes dull, undoubtedly; but this may be said with equal truth of the most faithful and laborious writers.

5. Many suppose that there is a certain natural talent, essential to success in extempore speaking, no less than in poetry; and that it is absurd to recommend the art to those who have not this peculiar talent, and vain for them to attempt its practice.

In regard to that ready flow of words, which seems to be the natural gift of some men, it is of little consequence whether it be really such, or be owing to the education and habits of early life, and vain self-confidence. It is certain that diffidence and the want of habit are great hindrances to fluency of speech; and it is equally certain, that this natural fluency is a very questionable advantage to him who would be an impressive speaker. It is quite observable that those who at first talk easiest, do not always talk best. Their very facility is a snare to them. It serves to keep them content,—they make no effort to improve, and are likely to fall into slovenly habits of elocution. So that this unacquired fluency is so far from essential, that it is not even a benefit, and it may be an injury. It keeps from final eminence by the very greatness of its early promise. On the other hand, he who possesses originally no remarkable command of language,

and whom an unfortunate bashfulness prevents from well using what he has, is obliged to subject himself to severe discipline—to submit to rules and tasks—to go through a tedious process of training—to acquire by much labour the needful sway over his thoughts and words, so that they shall come at his bidding, and not be driven away by his own diffidence or the presence of other men. To do all this is a long and disheartening labour. He is exposed to frequent mortifications, and must endure many grievous failures, before he attain that confidence which is indispensable to success. But then in this discipline, his powers, mental and moral, are strained up to the highest intenseness of action;—after persevering practice, they become habitually subject to his control, and work with a precision, exactness, and energy, which can never be the possession of him who has depended on his native, undisciplined gift. Of the truth of this, examples are by no means wanting, and I could name, if it were proper, more than one striking instance within my own observation. It was probably this to which Newton referred, when he said, that he never spoke well till he felt that he could not speak at all. Let no one therefore think it an obstacle in his way that he has no readiness of words. If he have good sense and no deficiency of talent, and is willing to labour for this as all great acquisitions must be laboured for, he needs not fear but that in time he will attain it.

We must be careful, however, not to mistake the object to be attained. It is not a high rank in oratory, consummate eloquence. If it were, then indeed a young man might pause till he had ascertained whether he possessed all those extraordinary endowments of intellect, imagination, sensibility, countenance, voice, and person, which belong to few men in a century, and without which, the great orator does not exist. He is one of those splendid formations of nature, which she exhibits but rarely; and it is not necessary to the object of his pursuit that the minister be such. The purposes of his office are less ambitious,—to impart instruction and do good; and it is by no means certain that the greatest

eloquence is best adapted to these purposes in the pulpit. But any man, with powers which fit him for the ministry at all,—unless there be a few extraordinary exceptions—is capable of learning to express himself clearly, correctly, and with method; and this is precisely what is wanted, and no more than this. I do not say eloquently; for as it is not thought indispensable that every writer of sermons should be eloquent, it cannot be thought essential that every speaker should be so. But the same powers which have enabled him to write, will, with sufficient discipline, enable him to speak; with every probability that when he comes to speak with the same ease and collectedness, he will do it with a nearer approach to eloquence. Without such discipline he has no right to hope for success; let him not say that success is impossible, until he has submitted to it.

I apprehend that these remarks will be found not only correct in theory, but agreeable to experience. With the exceeding little systematic cultivation of the art which there is amongst us, and no actual instruction, we find that a great majority of the lawyers in our courts, and not a small portion of the members of our legislatures, are able to argue and debate. In some of the most popular and quite numerous religious sects, we find preachers enough, who are able to communicate their thoughts, and harangue their congregations, and exert very powerful and permanent influence over large bodies of the people. Some of these are men of as small natural talents, and as limited education as any that enter the sacred office. It should seem therefore that no one needs to despair.

In the ancient republics of Greece and Rome, this accomplishment was a necessary branch of a finished education. A much smaller proportion of the citizens were educated than amongst us; but of these a much larger number became orators. No man could hope for distinction or influence, and yet slight this art.* The

* It is often said that extemporaneous speaking is the distinction of modern eloquence. But the whole language of Cicero's rheto-

commanders of their armies were orators as well as soldiers, and ruled as well by their rhetorical, as by their military skill. There was no trusting with them as with us to a natural facility, or the acquisition of an accidental fluency by actual practice: but they served an apprenticeship to the art. They passed through a regular course of instruction in schools. They submitted to long and laborious discipline. They exercised themselves frequently, both before equals and in the presence of teachers, who criticised, reproved, rebuked, excited emulation, and left nothing undone which art and perseverance could accomplish. The greatest orators of antiquity, so far from being favoured by natural tendencies, except indeed in their high intellectual endowments, had to struggle against natural obstacles; and instead of growing up spontaneously to their unrivalled eminence, they forced themselves forward by the most discouraging artificial process. Demosthenes combated an impediment in speech, and ungainliness of gesture, which at first drove him from the forum in disgrace. Cicero failed at first through weakness of lungs, and an excessive vehemence of manner, which wearied the hearers, and defeated his own purpose. These defects were conquered by study and discipline. Cicero exiled himself from home, and during his absence in various lands passed not a day without a rhetorical exercise; seeking the masters who were most severe in criticism, as the surest means of leading him to the perfection at which he aimed. Such too was the education of their other great men. They were all, according to their ability and station, orators; orators, not by nature or accident, but by education; formed in a strict process of rhetorical training; admired and followed even while Demosthenes and Cicero were living, and unknown now, only because it is not possible that any but the first should survive the ordeal of ages.

rical works, as well as particular terms in common use, and anecdotes recorded of different speakers, prove the contrary; not to mention Quinctilian's express instructions on the subject. Hume also tells us from Suidas, that the writing of speeches was unknown until the time of Pericles.

The inference to be drawn from these observations is, that if so many of those who received an accomplished education became accomplished orators, (because to become so was one purpose of their study,) then it is in the power of a much larger proportion amongst us to form themselves into creditable and accurate speakers. The inference should not be denied until proved false by experiment. Let this art be made an object of attention, and young men train themselves to it faithfully and long; and if any of competent talents and tolerable science be found at last incapable of expressing themselves in continued and connected discourse, so as to answer the ends of the Christian ministry, then, and not till then, let it be said that a peculiar talent or natural aptitude is requisite, the want of which must render effort vain,—then, and not till then, let us acquiesce in this indolent and timorous notion, which contradicts the whole testimony of antiquity, and all the experience of the world. Doubtless, after the most that can be done, there will be found the greatest variety of attainment,—" men will differ," as Burnet remarks, " quite as much as in their written compositions ;" and some will do but poorly what others will do excellently. But this is likewise true of every other art in which men engage, and not least so of writing sermons,—concerning which no one will say, that as poor are not written, as it would be possible for any one to speak. In truth, men of small talents and great sluggishness, of a feeble sense of duty and no zeal, will of course make poor sermons, by whatever process they may do it, let them write or let them speak. It is doubtful concerning some whether they would even steal good ones.

The survey we have now taken renders it evident, that the evils which are principally objected against as attending this mode of preaching are not necessary evils, but are owing to insufficient study and preparation before the practice is commenced, and indolence afterward. This is implied in the very expressions of the objectors themselves, who attribute the evil to " beginning at the wrong end, attempting to speak before studying the art of oratory, or even storing the mind with treasures of

thought and language." It is also implied in this language, that study and preparation are capable of removing the objections. I do not therefore advocate the art, without insisting on the necessity of severe discipline and training. No man should be encouraged or permitted to adopt it, who will not take the necessary pains, and proceed with the necessary perseverance.

This should be the more earnestly insisted upon, because it is from our loose and lazy notions on the subject that eloquence in every department is suffering so much, and that the pulpit especially has become so powerless, —where the most important things that receive utterance upon earth are sometimes read like schoolboys' tasks, without even the poor pains to lay emphasis on the right words, and to pause in the right places. And this, because we fancy that, if nature have not designed us for orators, it is vain to make effort, and if she have, we shall be such without effort. True, that the noble gifts of mind are from nature; but not language, or knowledge, or accent, or tone, or gesture,—these are to be learned, and it is with these that the speaker is concerned. These are all matters of acquisition, and of difficult acquisition,—possible to be attained, and well worth the exertion that must be made.

The history of the world is full of testimony to prove how much depends upon industry; not an eminent orator has lived, but is an example of it. Yet in contradiction to all this, the almost universal feeling appears to be, that industry can effect nothing, that eminence is the result of accident, and that every one must be content to remain just what he may happen to be. Thus multitudes, who come forward as teachers and guides, suffer themselves to be satisfied with the most indifferent attainments and a miserable mediocrity, without so much as inquiring how they might rise higher, much less making any attempt to rise. For any other art they would have served an apprenticeship, and would be ashamed to practise it in public before they had learned it. If any one would sing, he attends a master, and is drilled in the very elementary principles; and only after the most laborious process dares

to exercise his voice in public. This he does, though he has scarce any thing to learn but the mechanical execution of what lies in sensible forms before his eye. But the extemporaneous speaker, who is to invent as well as to utter, to carry on an operation of the mind as well as to produce sound, enters upon the work without preparatory discipline, and then wonders that he fails! If he were learning to play on the flute for public exhibition, what hours and days would he spend in giving facility to his fingers, and attaining the power of the sweetest and most impressive execution. If he were devoting himself to the organ, what months and years would he labour, that he might know its compass, and be master of its keys, and be able to draw out at will all its various combinations of harmonious sound, and its full richness and delicacy of expression. And yet he will fancy that the grandest, the most various, the most expressive of all instruments, which the infinite Creator has fashioned by the union of an intellectual soul with the powers of speech, may be played upon without study or practice; he comes to it, a mere uninstructed tyro, and thinks to manage all its stops, and command the whole compass of its varied and comprehensive power! He finds himself a bungler in the attempt, is mortified at his failure, and settles it in his mind for ever that the attempt is vain.

Success in every art, whatever may be the natural talent, is always the reward of industry and pains. But the instances are many of men of the finest natural genius, whose beginning has promised much, but who have degenerated wretchedly as they advanced, because they trusted to their gifts and made no effort to improve. That there have never been other men of equal endowments with Demosthenes and Cicero, none would venture to suppose; but who have so devoted themselves to their art, or become equal in excellence? If those great men had been content, like others, to continue as they began, and had never made their persevering efforts for improvement, what would their countries have benefited from their genius, or the world have known of their fame? They would have been lost in the undistinguished crowd, that sunk to

oblivion around them. Of how many more will the same remark prove true! What encouragement is thus given to the industrious! With such encouragement, how inexcusable is the negligence which suffers the most interesting and important truths to seem heavy and dull, and fall ineffectual to the ground, through mere sluggishness in their delivery! How unworthy of one who performs the high function of a religious instructor,—upon whom depend, in a great measure, the religious knowledge and devotional sentiment and final character of many fellow beings,—to imagine that he can worthily discharge this great concern by occasionally talking for an hour, he knows not how, and in a manner which he has taken no pains to render correct, impressive, or attractive; and which simply through want of that command over himself which study would give, is immethodical, verbose, inaccurate, feeble, trifling. It has been said of the good preacher, that "truths divine come mended from his tongue." Alas, they come ruined and worthless from such a man as this. They lose that whole energy by which they are to convert the soul and purify man for heaven, and sink in interest and efficacy below the level of those principles which govern the ordinary affairs of this lower world.

CHAPTER III.

RULES OF EXTEMPORANEOUS PREACHING.

The observations contained in the preceding chapter make it sufficiently evident, that the art of extemporaneous speaking, however advantageous to the Christian minister and however possible to be acquired, is yet attended with embarrasments and difficulties, which are to be removed only by long and arduous labour. It is not enough, however, to insist upon the necessity of this discipline. We must know in what it consists, and how it is to be conducted. In completing, therefore, the plan I have proposed to myself, I am now to give a few hints respecting the mode in which the study is to be carried on, and ob-

stacles to be surmounted. These hints, gathered partly from experience and partly from observation and books, will be necessarily incomplete; but not, it is hoped, altogether useless to those who are asking some direction.

1. The first thing to be observed is, that the student who would acquire facility in this art, should bear it constantly in mind, and have regard to it in all his studies, and in his whole mode of study. The reason is very obvious. He that would become eminent in any pursuit, must make it the primary and almost exclusive object of his attention. It must never be long absent from his thoughts, and he must be contriving how to promote it in every thing he undertakes. It is thus that the miser accumulates, by making the most trifling occurrences the occasions of gain; and thus the ambitious man is on the alert to forward his purposes of advancement by little events which another would pass unobserved. So too he, the business of whose life is preaching, should be on the watch to render every thing subservient to this end. The inquiry should always be, how he can turn the knowledge he is acquiring, the subject he is studying, this mode of reasoning, this event, this conversation, and the conduct of this or that man, to aid the purposes of religious instruction. He may find an example in the manner in which Pope pursued his favourite study. "From his attention to poetry," says Johnson, "he was never diverted. If conversation offered any thing that could be improved, he committed it to paper; if a thought or perhaps an expression, more happy than was common, rose to his mind, he was careful to write it; an independent distich was preserved for an opportunity of insertion, and some little fragments have been found containing lines, or parts of lines, to be wrought upon at some other time." By a like habitual and vigilant attention, the preacher will find scarce any thing but may be made to minister to his great design, by either giving rise to some new train of thought, or suggesting an argument, or placing some truth in a new light, or furnishing some useful illustration. Thus none of his reading will be lost; every poem and play, every treatise on science, and speculation in philosophy, and even

every ephemeral tale may be made to give hints toward the better management of sermons, and the more effectual proposing and communicating of truth.

He who proposes to himself the art of extemporaneous speaking should in like manner have constant regard to this particular object, and make every thing co-operate to form those habits of mind which are essential to it. This may be done, not only without any hindrance to the progress of his other studies, but even so as to promote them. The most important requisites are rapid thinking, and ready command of language. By rapid thinking I mean, what has already been spoken of, the power of seizing at once upon the most prominent points of the the subject to be discussed, and tracing out, in their proper order, the subordinate thoughts which connect them together. This power depends very much upon habit; a habit more easily acquired by some minds than by others, and by some with great difficulty. But there are few who, should they have a view to the formation of such a habit in all their studies, might not attain it in a degree quite adequate to their purpose. This is much more indisputably true in regard to fluency of language.

Let it, therefore, be a part of his daily care, to analyse the subjects which come before him, and to frame sketches of sermons. This will aid him to acquire a facility in laying open, dividing, and arranging topics, and preparing those outlines which he is to take with him into the pulpit. Let him also investigate carefully the method of every author he reads, marking the divisions of his arrangement, and the connection and train of his reasoning. Butler's preface to his Sermons will afford him some fine hints on this way of study. Let this be his habitual mode of reading, so that he shall as much do this, as receive the meaning of separate sentences, and shall be always able to give a better account of the progress of the argument and the relation of every part to the others and to the whole, than of merely individual passages and separate illustrations. This will infallibly beget a readiness in finding the divisions and boundaries of a subject, which is one important requisite to an easy and successful speaker.

In a similar manner, let him always bear in mind the value of a fluent and correct use of language. Let him not be negligent of this in his conversation; but be careful ever to select the best words, to avoid a slovenly style and drawling utterance, and to aim at neatness, force and brevity. This may be done without formality, or stiffness, or pedantic affectation; and when settled into a habit is invaluable.

2. In addition to this general cultivation, there should be frequent exercise of the act of speaking. Practice is essential to perfection in any art, and in none more so than in this. No man reads well or writes well except by long practice; and he cannot expect without it to speak well,—an operation which is equivalent to the other two united. He may indeed get along, as the phrase is; but not so well as he might do and should do. He may not always be able even to get along. He may be as sadly discomfited as a friend of mine, who said that he had made the attempt, and was convinced that for him to speak extempore was impossible; he had risen from his study-table, and tried to make a speech, proving that virtue is better than vice; but stumbled and failed at the very outset. How could one hope to do better in a first attempt, if he had not considered beforehand what he should say? It were as rational to think he could play on the organ without having learned, or translate from a language he had never studied.

It would not be too much to require of the student, that he should exercise himself every day once at least, if not oftener; and this on a variety of subjects, and in various ways, that he may attain a facility in every mode. It would be a pleasant interchange of employment, to rise from the subject which occupies his thoughts, or from the book which he is reading, and repeat to himself the substance of what he has just perused, with such additions and variations, or criticisms, as may suggest themselves at the moment. There could hardly be a more useful exercise, even if there were no reference to this particular end. How many excellent chapters of valuable authors, how many fine views of important subjects, would be thus

impressed upon his mind, and what rich treasures of thought and language would be thus laid up in store. And according as he should be engaged in a work of reasoning, or description, or exhortation, or narrative, he would be attaining the power of expressing himself readily in each of these various styles. By pursuing this course for two or three years, "a man may render himself such a master in this matter," says Burnet, "that he can never be surprised;" and he adds, that he never knew a man faithfully to pursue the plan of study he proposed, without being successful at last.

3. When by such a course of study and discipline he has attained a tolerable fluency of thoughts and words, and a moderate confidence in his own powers, there are several things to be observed in first exercising the gift in public, in order to ensure comfort and success.

It is recommended by Bishop Burnet and others, that the first attempts be made by short excursions from written discourses; like the young bird that tries its wings by short flights, till it gradually acquires strength and courage to sustain itself longer in the air. This advice is undoubtedly judicious. For one may safely trust himself in a few sentences, who would be confounded in the attempt to frame a whole discourse. For this purpose blanks may be left in writing, where the sentiment is familiar, or only a short illustration is to be introduced. As success in these smaller attempts gives him confidence, he may proceed to larger; till at length, when his mind is bright and his feelings engaged, he may quit his manuscript altogether, and present the substance of what he had written, with greater fervour and effect, than if he had confined himself to his paper. It was once observed to me by an interesting preacher of the Baptist denomination, that he had found from experience this to be the most advisable and perfect mode; since it combined the advantages of written and extemporaneous composition. By preparing sermons in this way, he said, he had a shelter and security if his mind should be dull at the time of delivery; and if it were active, he was able to leave what he had written, and obey the ardour of his feelings, and go forth on

the impulse of the moment, wherever his spirit might lead him. A similar remark I heard made by a distinguished scholar of the Methodist connection, who urged, what is universally asserted by those who have tried this method with any success, that what has been written is found to be tame and spiritless, in comparison with the animated glow of that which springs from the energy of the moment.

There are some persons, however, who would be embarrassed by an effort to change the operation of the mind from reading to inventing. Such persons may find it best to make their beginning with a whole discourse.

4. In this case, there will be a great advantage in selecting for first efforts expository subjects. To say nothing of the importance and utility of this mode of preaching, which render it desirable that every minister should devote a considerable proportion of his labours to it; it contains great facilities and reliefs for the inexperienced speaker. The close study of a passage of Scripture, which is necessary to expounding it, renders it familiar. The exposition is inseparably connected with the text, and necessarily suggested by it. The inferences and practical reflections are in like manner naturally and indissolubly associated with the passage. The train of remark is easily preserved, and embarrassment in a great measure guarded against, by the circumstance that the order of discourse is spread out in the open Bible, upon which the eyes may rest, and by which the thoughts may rally.

5. A similar advantage is gained to the beginner, in discourses of a different character, by a very careful and minute division of the subject. The division should not only be logical and clear, but into parts as numerous as possible. The great advantage here is, that the partitions being many, the speaker is compelled frequently to return to his minutes. He is thus kept in the track, and prevented from wandering far in needless digressions—that besetting infirmity of unrestrained extemporizers. He also escapes the mortifying consequences of a momentary confusion and cloudiness of mind, by having it

in his power to leave an unsatisfactory train at once, before the state of his mind is perceived by the audience, and take up the next topic, where he may recover his self-possession, and proceed without impediment. This is no unimportant consideration. It relieves him from the horror of feeling obliged to go on, while conscious that he is saying nothing to the purpose; and at the same time secures the very essential requisite of right method.

6. The next rule is, that the whole subject, with the order and connection of all its parts, and the entire train of thought, be made thoroughly familiar by previous meditation. The speaker must have the discourse in his mind as one whole, whose various parts are distinctly perceived as other wholes, connected with each other and contributing to a common end. There must be no uncertainty, when he rises to speak, as to what he is going to say; no mist or darkness over the land he is about to travel; but, conscious of his acquaintance with the ground, he must step forward confidently, not doubting that he shall find the passes of its mountains, and thread the intricacies of its forests, by the paths which he has already trodden. It is an imperfect and partial preparation in this respect, which so often renders the manner awkward and embarrassed, and the discourse obscure and perplexed. "*Nemo potest de eâ re, quam non novit, non turpissime dicere.*" But when the preparation is faithful, the speaker feels at home; being under no anxiety respecting the ideas or the order of their succession, he has the more ready control of his person, his eye, and his hand, and the more fearlessly gives up his mind to its own action and casts himself upon the current. Uneasiness and constraint are the inevitable attendants of unfaithful preparation, and they are fatal to success.

It is true, that no man can attain the power of self-possession, so as to feel at all times equally and entirely at ease. But he may guard against the sorest ills which attend its loss, by always making sure of a train of thought,—being secure that he has ideas, and that they lie in such order as to be found and brought forward in some sort of apparel, even when he has in some measure

lost the mastery of himself. The richness or meanness of their dress will depend on the humour of the moment. It will vary as much as health and spirits vary, which is more in some men than in others. But the thoughts themselves he may produce, and be certain of saying *what* he intended to say, even when he cannot say it *as* he intended. It must have been observed, by those who are at all in the habit of observation of this kind, that the mind operates in this particular like a machine, which, having been wound up, runs on by its own spontaneous action, until it has gone through its appointed course. Many men have thus continued speaking in the midst of an embarrassment of mind which rendered them almost unconscious of what they were saying, and incapable of giving an account of it afterward; while yet the unguided, self-moving intellect wrought so well, that the speech was not esteemed unwholesome or defective by the hearers. The experience of this fact has doubtless helped many to believe that they spoke from inspiration. It ought to teach all, that there is no sufficient cause for that excessive apprehension, which so often unmans them, and which, though it may not stop their mouths, must deprive their address of all grace and beauty, of all ease and force.

7. We may introduce in this place another rule, the observance of which will aid in preventing the ill consequences resulting from the accidental loss of self-possession. The rule is, Utter yourself very slowly and deliberately, with careful pauses. This is at all times a great aid to a clear and perspicuous statement. It is essential to the speaker who would keep the command of himself, and consequently of his hearers.

One is very likely, when, in the course of speaking, he has stumbled on an unfortunate expression, or said what he would prefer not to say, or for a moment lost sight of the precise point at which he was aiming, to hurry on with increasing rapidity, as if to get as far as possible from his misfortune, or cause it to be forgotten in the crowd of new words. But instead of thus escaping the evil, he increases it; he entangles himself more and more; and augments the difficulty of recovering his

route. The true mode of recovering himself is by increased deliberation. He must pause, and give himself time to think;—"*ut tamen deliberare non hæsitare videatur.*" He need not be alarmed lest his hearers suspect the difficulty. Most of them are likely to attribute the slowness of his step to any cause rather than the true one. They take it for granted, that he says and does precisely as he intended and wished. They suppose that he is pausing to gather up his strength. It excites their attention. The change of manner is a relief to them. And the probability is, that the speaker not only recovers himself, but that the effort to do it gives a spring to the action of his powers, which enables him to proceed afterward with greater energy.

8. In regard to language, the best rule is, that no preparation be made. There is no convenient and profitable medium between speaking from memory, and from immediate suggestion. To mix the two is no aid, but a great hindrance, because it perplexes the mind between the very different operations of memory and invention. To prepare sentences, and parts of sentences, which are to be introduced here and there, and the intervals between them to be filled up in the delivery, is the surest of all ways to produce constraint. It is like the embarrassment of framing verses to prescribed rhymes; as vexatious, and as absurd. To be compelled to shape the course of remark so as to suit a sentence which is by and by to come, or to introduce certain expressions which are waiting for their place, is a check to the natural current of thought. The inevitable consequence is constraint and labour, the loss of every thing like easy and flowing utterance, and perhaps that worst of confusion which results from a jumble of ill-assorted, disjointed periods. It is unavoidable that the subject should present itself in a little different form and complexion in speaking, from that which it took in meditation; so that the sentences and modes of expression, which agreed very well with the train of remark as it came up in the study, may be wholly unsuited to that which it assumes in the pronunciation.

The extemporaneous speaker should therefore trust himself to the moment for all his language. This is the safe way for his comfort, and the only sure way to make all of a uniform piece. The general rule is certain, though there may be some exceptions. It may be well, for example, to consider what synonymous terms may be employed in recurring to the chief topic, in order to avoid the too frequent reiteration of the same word. This will occasion no embarrassment. He may also prepare texts of Scripture to be introduced in certain parts of the discourse. These, if perfectly committed to memory, and he be not too anxious to make a place for them, will be no encumbrance. When a suitable juncture occurs, they will suggest themselves, just as a suitable epithet suggests itself. But if he be very solicitous about them, and continually on the watch for an opportunity to introduce them, he will be likely to confuse himself. And it is better to lose the choicest quotation, than suffer constraint and awkwardness from the effort to bring it in. Under the same restrictions he may have ready, pithy remarks, striking and laconic expressions, pointed sayings and aphorisms, the force of which depends on the precise form of the phrase. Let the same rule be observed in regard to such. If they suggest themselves (which they will do, if there be a proper place for them), let them be welcome. But never let him run the risk of spoiling a whole paragraph in trying to make a place for them.

Many distinguished speakers are said to do more than this—to write out with care, and repeat from memory their more important and persuasive parts; like the *de bene esse's* of Curran, and the splendid passages of many others. This may undoubtedly be done to advantage by one who has the command of himself which practice gives, and has learned to pass from memory to invention without tripping. It is a different case from that mixture of the two operations, which is condemned above, and is in fact only an extended example of the exceptions made in the last paragraph. With these exceptions, when he undertakes, *bona fide*, an extemporaneous address, he

should make no preparation of language. Language is the last thing he should be anxious about. If he have ideas, and be awake, it will come of itself, unbidden and unsought-for. The best language flashes upon the speaker as unexpectedly as upon the hearer. It is the spontaneous gift of the mind, not the extorted boon of a special search. No man who has thoughts, and is interested in them, is at a loss for words—not the most uneducated man; and the words he uses will be according to his education and general habits, not according to the labour of the moment. If he truly feel, and wish to communicate his feelings to those around him, the last thing that will fail will be language,—the less he thinks of it and cares for it, the more copiously and richly will it flow from him; and when he has forgotten every thing but his desire to give vent to his emotions and do good, then will the unconscious torrent pour, as it does at no other season. This entire surrender to the spirit which stirs within, is indeed the real secret of all eloquence. "True eloquence," says Milton, "I find to be none but the serious and hearty love of truth; and that whose mind soever is fully possessed with a fervent desire to know good things, and with the dearest charity to infuse the knowledge of them into others,—when such a man would speak, his words, like so many nimble and airy servitors, trip about him at command, and in well-ordered files, as he would wish, fall aptly into their own places."—"*Rerum enim copia* (says the great Roman teacher and example) *verborum copiam gignit; et, si est honestas in rebus ipsis de quibus dicitur, existit ex rei naturâ quidam splendor in verbis. Sit modo is, qui dicet aut scribet, institutus liberaliter educatione doctrinâqua puerili, et flagret studio, et a naturâ adjuvetur, et in universorum generum infinitis disceptationibus exercitatus; ornatissimos scriptores oratoresque ad cognoscendum imitandumque de legerit;—næ ille haud sane, quemadmodum verba struat et illuminet, a magistris istis requiret. Ita facile in rerum abundantiâ ad orationis ornamenta, sine duce, naturâ ipsâ, si modo est exercitata, labetur.*"*

* De Orat. iii. 31.

9. These remarks lead to another suggestion which deserves the student's consideration. He should select for this exercise those subjects in which he feels an interest at the time, and in regard to which he desires to engage the interest of others. In order to the best success, extemporaneous efforts should be made in an excited state of mind, when the thoughts are burning and glowing, and long to find vent. There are some topics which do not admit of this excitement. Such should be treated by the pen. When he would speak, he should choose topics on which his own mind is kindling with a feeling which he is earnest to communicate; and the higher the degree to which he has elevated his feelings, the more readily, happily, and powerfully will he pour forth whatever the occasion may demand. There is no style suited to the pulpit, which he will not more effectually command in this state of mind. He will reason more directly, pointedly, and convincingly;—he will describe more vividly from the living conceptions of the moment;—he will be more earnest in persuasion, more animated in declamation, more urgent in appeals, more terrible in denunciation. Every thing will vanish from before him, but the subject of his attention, and upon this his powers will be concentrated in keen and vigorous action.

If a man would do his best, it must be upon topics which are at the moment interesting to him. We see it in conversation, where every one is eloquent upon his favourite subjects. We see it in deliberative assemblies, where it is those grand questions which excite an intense interest, and absorb and agitate the mind, that call forth those bursts of eloquence by which men are remembered as powerful orators, and that give a voice to men who can speak on no other occasions. Cicero tells us of himself, that the instances in which he was most successful, were those in which he most entirely abandoned himself to the impulses of feeling. Every speaker's experience will bear testimony to the same thing; and thus the saying of Goldsmith proves true, that "to feel one's subject thoroughly, and to speak without fear, are the only rules of eloquence." Let him who would preach successfully re-

member this. In the choice of subjects for extemporaneous efforts, let him have regard to it, and never encumber himself nor distress his hearers, with the attempt to interest them in a subject, which excites at the moment only a feeble interest in his own mind.

This rule excludes many topics which it is necessary to introduce into the pulpit—subjects in themselves interesting and important, but which few men can be trusted to treat in unpremeditated language; because they require an exactness of definition, and nice discrimination of phrase, which may be better commanded in the cool leisure of writing, than in the prompt and declamatory style of the speaker. The rule also forbids the attempt to speak, when ill health, or lowness of spirits, or any accidental cause, renders him incapable of that excitement which is requisite to success. It requires of him to watch over the state of his body—the partial derangement of whose functions so often confuses the mind—that, by preserving a vigorous and animated condition of the corporeal system, he may secure vigour and vivacity of mind. It requires of him, finally, whenever he is about entering upon the work, to use every means, by careful meditation,—by calling up the strong motives of his office,—by realizing the nature aud responsibility of his undertaking, and by earnestly invoking the blessing of God,—to attain that frame of devout engagedness, which will dispose him to speak zealously and fearlessly.

10. Another important item in the discipline to be passed through, consists in attaining the habit of self-command. I have already adverted to this point, and noticed the power which the mind possesses of carrying on the premeditated operation, even while the speaker is considerably embarrassed. This is, however, only a reason for not being too much distressed by the feeling when only occasional; it does not imply that it is no evil. It is a most serious evil; of little comparative moment, it may be, when only occasional and transitory, but highly injurious if habitual. It renders the speaker unhappy, and his address ineffective. If perfectly at ease, he would have every thing at command, and be able to pour out his

thoughts in lucid order, and with every desirable variety of manner and expression. But when thrown from his self-possession, he can do nothing better than mechanically string together words, while there is no soul in them, because his mental powers are spell-bound and imbecile. He stammers, hesitates, and stumbles; or, at best, talks on without object or aim, as mechanically and unconsciously as an automaton. He has learned little effectually, till he has learned to be collected.

This therefore must be a leading object of attention. It will not be attained by men of delicacy and sensibility, except by long and trying practice. It will be the result of much rough experience, and many mortifying failures. And, after all, occasions may occur when the most experienced will be put off their guard. Still, however, much may be done by the control which a vigorous mind has over itself, by resolute and persevering determination, by refusing to shrink or give way, and by preferring always the mortification of ill success, to the increased weakness which would grow out of retreating.

There are many considerations besides, which if kept before the mind would operate not a little to strengthen its confidence in itself. Let the speaker be sensible that if self-possessed, he is not likely to fail; that after faithful study and preparation, there is nothing to stand in his way, but his own want of self-command. Let him heat his mind with his subject, endeavour to feel nothing, and care for nothing, but that. Let him consider, that his audience takes for granted that he says nothing but what he designed, and does not notice those slight errors which annoy and mortify him; that in truth such errors are of no moment; that he is not speaking for reputation and display, nor for the gratification of others by the exhibition of a rhetorical model, or for the satisfaction of a cultivated taste; but that he is a teacher of virtue, a messenger of Jesus Christ, a speaker in the name of God; whose chosen object it is to lead men above all secondary considerations and worldly attainments, and to create in them a fixed and lasting interest in spiritual and religious concerns;—that he himself therefore ought to

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and open his lips boldly, when the fear of man would keep them closed. Art may fail him, and all his treasures of knowledge desert him; but if his heart be warm with love, he will "speak right on," aiming at the heart, and reaching the heart, and satisfied to accomplish the great purpose, whether he be thought to do it tastefully or not.

This is the true spirit of his office, to be cherished and cultivated above all things else, and capable of rendering all its labours comparatively easy. It reminds him that his purpose is not to make profound discussions of theological doctrines, or disquisitions on moral and metaphysical science, but to present such views of the great and acknowledged truths of Revelation, with such applications of them to the understanding and conscience, as may affect and reform his hearers. Now it is not study only, in divinity or in rhetoric, which will enable him to do this. He may reason ingeniously, but not convincingly: he may declaim eloquently, but not persuasively. There is an immense, though indescribable difference between the same arguments and truths, as presented by him who earnestly feels and desires to persuade, and by him who designs only a display of intellectual strength, or an exercise of rhetorical skill. In the latter case, the declamation may be splendid, but it will be cold and without expression—lulling the ear, and diverting the fancy, but leavings the feelings untouched. In the other, there is an air of reality and sincerity, which words cannot describe but which the heart feels, that finds its way to the recesses of the soul, and overcomes it by a powerful sympathy. This is a difference which all perceive and all can account for. The truths of religion are not matters of philosophical speculation but of experience. The heart and all the spiritual man, and all the interests and feelings of the immortal being, have an intimate concern in them. It is perceived at once whether they are stated by one who has felt them himself—is personally acquainted with their power—is subject to their influence, and speaks from actual experience; or whether they come from one who knows them only in speculation, has gathered them

from books, and thought them out by his own reason, but without any sense of their spiritual operation.

But who does not know how much easier it is to declare what has come to our knowledge from our own experience, than what we have gathered coldly at second-hand from that of others;—how much easier it is to describe feelings we have ourselves had, and pleasures we have ourselves enjoyed, than to fashion a description of what others have told us;—how much more freely and convincingly we can speak of happiness we have known, than of that to which we are strangers? We see, then, how much is lost to the speaker by coldness or ignorance in the exercises of personal religion. How can he effectually represent the joys of a religious mind, who has never known what it is to feel them? How can he effectually aid the contrite, the desponding, the distrustful, the tempted, who has never himself passed through the same fears and sorrows? or how can he paint, in the warm colours of truth, religious exercises and spiritual desires, who is personally a stranger to them? Alas, he cannot at all come in contact with those souls, which stand most in need of his sympathy and aid. But if he have cherished in himself, fondly and habitually, the affections he would excite in others,—if he have combated temptation, and practised self-denial, and been instant in prayer, and tasted the joy and peace of a tried faith and hope,—then he may communicate directly with the hearts of his fellow-men, and win them over to that which he so feelingly describes. If his spirit be always warm and stirring with these pure and kind emotions, and anxious to impart the means of his own felicity to others, how easily and freely will he pour himself forth! and how little will he think of the embarrassments of the presence of mortal man, while he is conscious only of labouring for the glory of the ever present God!

This, then, is the one thing essential to be attained and cherished by the Christian preacher. With this he must begin, and with this he must go on to the end. Then he never can greatly fail; for he will FEEL HIS SUBJECT THOROUGHLY, AND SPEAK WITHOUT FEAR.

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THE

HISTORICAL

AND

GEOLOGICAL DELUGES

COMPARED.

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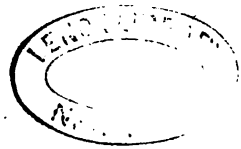
MDCCCXXXVII.



JAMES BURNET, Printer, 23 Thistle Street.

THE

HISTORICAL AND GEOLOGICAL DELUGES

COMPARED.

SCARCELY any subject within the circle of human knowledge has elicited more discussion than the origin, nature and connection of the deluges of history, tradition, and geology. Though in fact one of the most difficult of all subjects, yet upon a superficial and *prima facie* view, it seems to be one of the easiest. History and tradition abound with examples of diluvial catastrophes, which are supposed to have happened in the earliest times. Equally prolific is geology in phenomena that appear to be mementos of similar events. Marine relics are scattered in profusion over all continents in the form of petrefactions. How natural for the believer in the Bible to refer all these facts to the deluge of Noah; and to regard them as incontestible evidence of that event! But when we come to look more narrowly at these facts, and study them thoroughly in all their relations, we find a multitude of difficulties starting up to perplex us, and the beautiful simplicity of the popular argument is destroyed. Yet multitudes have produced voluminous essays on the deluge, without even discovering that the ground beneath them was hollow. We tremble in attempting to discuss this subject, lest our present effort should only add another example of a similar failure. We have got, however, too deeply interested in it to shrink from the effort.

1. *Our first object will be to present a brief view of the historical deluges.*

The Mosaic history of the deluge of Noah, being the account with which we wish to compare all others, may properly first claim our attention; though we need not present all the details here, since they are so familiar.

According to Blair's chronology, this deluge occurred 1656 years from the creation of man, or 2348 years before Christ. On Sunday, November 30th, Noah was commanded to enter the ark, taking with him his wife and three sons, with their wives. One week afterwards, on December 7th, it commenced a forty days' rain, and *the fountains of the great deep were broken up*; so that its waters rose over the land, until *all the high hills under the whole heaven were covered. Fifteen cubits* (22 feet,) *upward did the waters prevail*, (rise.) On Wednesday, May 6th, or 150 days after the deluge began, the ark rested upon the mountains of Ararat, or Armenia; the waters having begun to abate. They continued to decrease till Sunday, July 19th, when the tops of the mountains were visible. On the 15th of June, Noah sent forth a raven from the ark, which never returned. June 22d, he sent forth a dove, which came back. Seven days afterwards, on June 29th, he despatched the dove again, to ascertain the state of the earth; and in the evening she returned with an olive-leaf in her mouth. After an interval of seven days, or July 6th, the dove was sent forth a third time, and returned no more. On the 23d of October, the waters were dried from off the earth; and on the 18th of December, Noah came out of the ark, built an altar, and offered sacrifice. So that this deluge continued a year and eighteen days.

Noah, on account of his piety, appears to have been warned of this flood 120 years before it happened; during which period, the divine forbearance waited upon the wicked, and Noah was employed in building the ark. Its length was 300 cubits, (450 feet;) its breadth 50 cubits, (75 feet;) and its height 30 cubits, (45 feet.) It was three stories in height, and had one window and

one door in the side. Noah was commanded to bring into this ark of every living thing of all flesh, two of every sort, male and female; both fowls, cattle and creeping things. Also of every clean beast, that is, such as were clean by the Jewish law, he was directed to take into the ark seven males and seven females, with provisions for himself, family, and all the animals.

The deluges that have been described by uninspired writers next claim our attention. And among the earliest traces of such catastrophes on record, we may reckon the Egyptian tradition of the successive destruction and renovation of the world at the end of the *Annus Magnus*, or at the time when the heavenly bodies have so completed their revolutions as to come together into the same celestial sign. This tradition was fully adopted by the Stoics, who described the catastrophes as of two kinds; the *Cataclysm*, or deluge which swept the globe of animal and vegetable life; and the *Ecpyrosis*, or destruction by fire, which dissolved the earth. After each renovation, the new formed inhabitants were virtuous and happy. Astrea descended to confer upon the world the golden age. But in process of time the race degenerated, bringing on the age of iron; and when the gods could no longer bear with men, they exterminated them by the cataclysm or ecpyrosis. Now although some writers attempt to explain how very naturally this notion of degeneracy may have sprung from the prevalent opinion, that natural events, which produce suffering, are penal, yet surely it is more philosophical, when we look at all the analogies between the sacred and heathen deluges, to refer this opinion to the actual wickedness of the antediluvians.

The fabulous period of Grecian history presents us with accounts of several famous deluges. They take their name from that of some renowned prince, who reigned at the time when they happened. One of these is said to have occurred in the time of Prometheus, who, according to the Grecian mythology, was one of the Titans, whom Jupiter chained to a rock on mount Caucasus, and suffered a vulture to feed continually upon his

liver. But according to others, he was nephew to the Egyptian Sesostris, and during his reign Egypt was deluged. Ogyges is said to have been a sovereign of Attica and Boeotia, and during his reign a deluge desolated the former country, in the year 1800 before Christ, according to Julius Africanus and others, but in the year 1045, B. C. according to Sir Isaac Newton. The deluge of Deucalion happened, it is said, 269 years after that of Ogyges, and overflowed all Thessaly; yet Deucalion is represented as the son of Prometheus; and some writers describe him as possessed of universal monarchy and as the father of the human race.

It has been the prevailing opinion among learned men in times past, that all these accounts had their origin in the deluge of Noah. But of late it is becoming quite common to regard them as distinct; as the description of various local deluges which happened in ancient times. We adhere to the old opinion, however, for the following reasons.

1. No dependence can be placed upon the chronological dates that have been assigned to these events. The discrepancy that exists in these dates, as given by respectable writers, would alone be sufficient to prove that there is no correct standard of judgment. But it is unnecessary to go into an argument to show, that the time when events happened, that are acknowledged to have occurred during the fabulous times of Grecian history, and in which gods and demi-gods played a part, is altogether apocryphal.

2. Some of these princes of diluvial memory are claimed by various nations. Deucalion, for instance, the most famous of them, was claimed by the Syrians as their progenitor; and he was supposed to have founded the temple at Hierapolis, where was a chasm through which the waters of the deluge were said to have retreated. The temple of Jupiter at Athens, also, was reported to have been founded by him, where there existed a similar tradition.

3. It is very natural for each nation to appropriate to itself the honour of having produced the only man of the

race, virtuous enough in time of great corruption, to escape destruction. Accordingly we find that other nations, besides the Greeks, have referred the same events to the time of one of their own distinguished rulers. Thus the Assyrians represent Sisithrus, or Xisuthrus, as preserved in the ark when all others were destroyed by a deluge. Osiris was the Egyptian Noah, and Satyavarman, or Satyavrata, the Hindoo Noah. In some heathen nations in the East, Noah himself is described as the individual preserved from the deluge, under the names of Noas, Noasis, Nusus and Nus; whence the Greek Dionusus, who is the Indian Bacchus. Philo expressly says, Ἕλληνες μὲν Δευκαλίωνα, Χαλδαῖοι δὲ ΝΩΕ ἐπονομάζουσιν, ἐφ' οὗ τὸν μέγαν κατακλυσμὸν συνέβη γενέσθαι. "The Grecians call him Deucalion, but the Chaldeans style him Noah, in whose time there happened the great eruption of waters." Another author says, Ὁ Νῶε Ξισουθρὸς παρὰ Χαλδαίοις.

4. Too many circumstances are common in the history of the Noachian and heathen deluges, to allow us to refer them to different catastrophes. Among the Romans, Ovid has described the deluge of Deucalion more fully than any other Latin author. After giving an account of the giants assailing heaven by piling mountains on mountains, and then of the "impious, arrogant, and cruel brood" that sprung out of "the impregnant earth" from their blood, he proceeds to say,

> But Jove
> Concludes to pour a watery deluge down,
> And what he durst not burn, concludes to drown.
> Impetuous rain descends;
> Nor from his patrimonial heaven alone
> Is Jove content to pour his vengeance down:
> Aid from his brother of the seas he craves,
> To help him with auxiliary waves.—
> Then with his mace, the monarch struck the ground,
> With inward trembling earth received the wound,
> And rising streams a ready passage found.—
> Now seas and earth were in confusion lost,
> A world of waters and without a coast.—
> A mountain of stupendous height there stands
> Betwixt the Athenian and Boeotian lands,

Parnassus is its name; whose forky rise
Mounts through the clouds and mates the lofty skies;
High on the summit of this dubious cliff,
Deucalion wafting moor'd his little skiff.
He with his wife were only left behind
Of perish'd man; they two were human kind—
The most upright of mortal men was he,
The most sincere and holy woman she.—
When Jupiter, surveying earth from high,
Beheld it in a lake of waters lie—
He loos'd the northern wind; fierce Boreas flies
To puff away the clouds and purge the skies.*

Lucian in his work *De Deâ Syriâ*, professes to give us the Grecian account of the same deluge. "The present race of mankind," he says, "are different from those who first existed; for those of the antediluvian world were all destroyed. The present world is peopled from the sons of Deucalion; having increased to so great a number from one person. In respect to the former brood, they were men of violence, and lawless in their dealings. They regarded not oaths, nor observed the rites of hospitality, nor showed mercy to those who sued for it. On this account they were doomed to destruction; and for this purpose there was a mighty eruption of waters from the earth, attended with heavy showers from above, so that the rivers swelled and the sea overflowed, till the whole earth was covered with a flood, and all flesh drowned. Deucalion alone was preserved to repeople the world. This mercy was shown him on account of his justice and piety. His preservation was effected in this manner. He put all his family, both his sons and their wives into a vast ark, which he had provided; and he went into it himself. At the same time animals of every species, boars, horses, lions, serpents, whatever lived upon the face of the earth, followed him by pairs; all which he received into the ark, and experienced no evil from them. As to what happened after this, there is an ancient tradition among those of Hierapolis, that in their country a great chasm opened

* Metam. Lib. I. Dryden's Translation.

and received all the water; whereupon Deucalion erected altars and built the temple of Juno over the chasm." Plutarch mentions that Deucalion sent out a dove from the ark, whose return indicated a continuance of the deluge; but its neglect to return, when sent out the second time, or as some say its return with muddy feet, showed that the waters had disappeared.

The Noah of Egypt appears to have been Osiris. Typhon—a personification of the sea—enticed him into an ark, which being closed, he was forced to sea; and it is a curious fact, that he embarked on the seventeenth day of the month Athyr, the very day, most probably, when Noah entered the ark.

Now how can this remarkable coincidence of circumstances be explained, without supposing one original source from which all proceeded? Some of them are so peculiar, that the most fertile imagination never could have invented them. Much less would they have occurred to men of different nations, opinions and education.

5. This conclusion is strengthened by the fact, that as we approach the country of Armenia, where Noah's ark rested, the more nearly do the traditions of deluges coincide with the Mosaic account. Probably, however, the account we have already given from Lucian, corresponds as nearly with the Mosaic history as any on record. Yet it ought to be recollected that this writer was a native of Samosata, on the banks of the Euphrates; and although he professes to give the Grecian account, it would be strange if he had not added some circumstances, which he doubtless learnt in early life in his native place. For we know that very distinct traditions concerning a mighty deluge existed in that region. For example; Berosus, a Chaldean priest, who lived 270 years before Christ, after stating that before the flood "there was a great city of giants, called Aeno, situated near Libanus, who governed the whole world," and who became excessively corrupt, proceeds thus: "There was one among the giants who reverenced the gods, and was more wise and prudent than all the rest;

his name was Noa; he dwelt in Syria, with his three sons, Sem, Japet, Cham, and their wives, the great Tidea, Pandora, Noela, and Noegla. This man, fearing the destruction which he foresaw from the stars would come to pass, began, in the 78th year before the inundation, to build a ship covered like an ark. Seventy-eight years from the time he began to build this ship, the ocean of a sudden broke out, and all the inland seas and the rivers and fountains bursting from beneath, (attended with the most violent rains from heaven for many days), overflowed all the mountains; so that the whole human race was buried in the waters, except Noa and his family, who were saved by means of the ship; which being lifted up by the waters, rested at last upon the top of the Gordyaean mountain, of which, it is reported, there now remaineth some part, and that men take away the bitumen from it, and make use of it by way of charm or expiation to avert evil.—We must, therefore, allow from these premises, that which both the Chaldeans and Scythians write of, that after the earth was dried from the waters, there were no more than the above-mentioned eight persons in Armenia, and that from these all men upon earth sprung; and for this reason it is, that the Scythians justly call Noa the father of all the greater and lesser gods, the author of the human race, the chaos, and seed of the world."

The tradition of the Assyrians on this subject, appears from a passage quoted by Eusebius from Abydenus. "After whom others reigned, and then Sisithrus; to whom Saturn foretold that there should be a great flood of waters, (or many showers), upon the fifteenth day of the month Desius; and ordered him to hide whatever writings he could find, in Heliopolis, a city of the Sippari. Sisithrus having performed this, immediately sailed towards Armenia; and instantly after, those things which God had foretold came to pass. And on the third day, when the tempest was ceased, he made a trial by sending out birds, to see if they could espy any land uncovered of water. But they finding nothing but the immense ocean, and not knowing which way to di-

rect themselves, returned to Sisithrus; and after these he sent out others; that the third time it answered, for the birds returned with their feet all mudded. But as for Sisithrus, the gods took him from among men. And the ship was carried to Armenia, and afforded the people of the country amulets of wood to expel diseases."*

Among the ancient Persians, the belief of a deluge prevailed with those who professed to hold to their religion in its purity. Zoroaster taught that it was occasioned by the wickedness of one Malcus; and one of their authors asserted that Noah himself dwelt in the mountain from which the waters burst forth.

It would seem, then, that in the countries around Armenia, the traditions of a deluge are less altered from the Mosaic account than in countries more remote, and less of fable is mixed with them. If that account be the original source from which all others were derived, we might expect that such would be the fact; and therefore it is a presumption in favour of such an opinion.

6. Analogous traditions respecting a deluge are found scattered over the whole globe. Some doubts had been expressed whether such a belief prevailed among the Chinese. But Sir William Jones says, "I may assure you, after full inquiry and consideration, that the Chinese believe the earth to have been wholly covered with water, which in works of undisputed authenticity, they describe as flowing abundantly, then subsiding, and separating the higher from the lower age of mankind; and that the divisions of time from which their poetical history begins, just preceded the appearance of Fohi in the mountains of China."†

The Hindoo tradition is very explicit. The following is Sir William Jones's abridged account of it, as it is contained in the poem of the Bhagavat. "The demon Hayagriva having purloined the vedas from the custody of Brahma, while he was reposing at the close of the

* See Bryant's Analysis of Ancient Mythology, Vol. 2. p. 212.
† Asiatic Researches, Vol. 2. Diss. on the Chinese.

sixth Manwantara, the whole race of men became corrupt, except the seven Rishis, and Satyavrata, who then reigned in Dravira, a maritime region to the south of Carnata. This prince was performing his ablutions in the river Critamala, when Vishnu appeared to him in the shape of a small fish, and after several augmentations of bulk in different waters, was placed by Satyavrata in the ocean, where he thus addressed his amazed votary: 'In seven days all creatures who have offended me shall be destroyed by a deluge, but thou shalt be secured in a capacious vessel miraculously formed. Take, therefore, all kinds of medicinal herbs, and esculent grain for food, and together with the seven holy men, your respective wives, and pairs of all animals, enter the ark without fear; then shalt thou know God face to face, and all thy questions shall be answered.' Saying this he disappeared; and after seven days the ocean began to overflow the coasts and the earth to be flooded by constant showers, when Satyavrata, meditating on the Deity, saw a large vessel moving on the waters. He entered it, having in all respects conformed to the instructions of Vishnu; who in the form of a vast fish, suffered the vessel to be tied with a great sea-serpent, as with a cable, to his measureless horn. When the deluge had ceased, Vishnu slew the demon, and recovered the vedas, instructed Satyavrata in divine knowledge, and appointed him the seventh Menu, by the name of Vaivaswata."* "And according to the Pauranias and the followers of Buddhu," says Capt. Wilford, "the ark rested on the mountains of Aryavarta, Aryawart, or India; an appellation which has no small affinity with the Ararat of Scripture."†

Sir William Jones has given some further particulars from the Hindoo traditions concerning this Satyavrata, which present a still more striking coincidence with the history of Noah subsequent to the deluge. "To Satyavarman, that sovereign of the whole earth, were born

* Asiatic Researches, Vol. 2. On Chronology of the Hindoos.
† Same work, Vol. 6. p. 521.

three sons; the eldest Sharma; then Charma," (in the common dialect, according to Wilford, pronounced Sham, and Cham,) " and the third Jyapeti by name. They were all men of good morals, excellent in virtue and virtuous deeds; skilled in the use of weapons, to strike with or to be thrown; brave men, eager for victory in battle. But Satyavarman, being continually delighted with devout meditation, and seeing his sons fit for dominion, laid upon them the burden of government, while he remained honouring and satisfying the gods, and priests, and kine. One day, by the act of destiny, the king having drunk mead, became senseless, and lay asleep naked; then was he seen by Charma, and by him were his two brothers called, to whom he said, 'what has now befallen? In what state is this our sire?' By those two was he hidden with clothes, and called to his senses again and again. Having recovered his intellect, and perfectly knowing what had passed, he cursed Charma, saying, 'Thou shalt be the servant of servants, and since thou wert a laughter in their presence, from laughter shalt thou acquire a name.' Then he gave to Charma the wide domain on the south of the snowy mountains—and to Jyapeti he gave all on the north of the snowy mountains, but he (Satyavarman) by the power of religious contemplation attained supreme bliss."*

If we pass now to the aboriginal nations of America, we shall find the same tradition prevalent, although fewer particulars are preserved, and the facts are more distorted. Acosta says that the Indians generally believed in a deluge, and " that all men were drowned in it. And they (the Mexicans) report that out of the great lake Titicaca came one Vivacocha, which staid in Tiguanaco—and so began mankind to multiply. Others report that six, or I know not what number of men, came out of a certain cave by a window; by whom men first began to multiply; and for this reason they call

* Asiatic Researches, Vol. 3. p. 263.

them Pacaritampo."* According to Herrera, the Mechoachans, a people comparatively in the neighbourhood of Mexico, believed that a single family was preserved during a deluge, in an ark, and a sufficient number of animals to people the new world. While confined in the ark several ravens were sent out, one of which returned with the branch of a tree. The Iroquois relate, that the world was created by a spirit, called Otkon, and repaired after a deluge by another, called Messore. The deluge happened in consequence of Otkon's dogs, when hunting, having got lost in a large lake, which in a short time covered the whole earth.† The inhabitants of Cuba related "that an old man knowing the deluge was to come, built a great ship, and went into it, with his family and abundance of animals; that he sent out a crow, which did not return, staying to feed on the dead bodies; and afterwards returned with a green branch; with other particulars, as far as Noah's sons covering him when drunk, and the others scoffing at it,"‡ &c. "In Peru," says Herrera in the same work, "the ancient Indians reported, they had received by tradition from their ancestors, that many years before there were any Incas, at the time when the country was very populous, there happened a great flood; the sea breaking out beyond its bounds, so that the land was covered with water, and all the people perished. The Guancas inhabiting the vale of Xausca, and the natives of Chiquito in the province of Callao, add that some persons remained in the hollows and caves of the highest mountains, who again peopled the land. Others of the mountain people affirm, that all perished in the deluge, only six persons being saved on a float, from whom descended all the inhabitants of the country." The natives of Terra Firma believe, "that when the universal deluge happened, one man, with his wife and children,

* Acosta's History of Indies, as quoted by Catcott on the Deluge, p. 71.

† Hennepin's Continuation of the New Discovery &c. as quoted in the same work, p. 72.

‡ Herrera's History of America, as quoted by Catcott, p. 72.

escaped in a canoe, and that from them the world had been peopled," &c. "The most barbarous of the Brazilians," says Herrera, "have some knowledge of a general deluge; it being their opinion that the whole race of mankind were extirpated by a general deluge, except one man and his own sister, who being with child before, they by degrees repeopled the world." The Brazilians near the coast, had a very particular tradition of a deluge, which grew out of a quarrel between two brothers, and which rose until the earth was entirely covered. All mankind were destroyed except the two brothers and their wives, who were saved by climbing trees on the tops of the mountains.

The tradition of a general flood is found among the natives of the South Sea Islands. The inhabitants of Tahiti, being asked concerning their origin, replied, that "their Supreme God, a long time ago, being angry, dragged the earth through the sea, when their island was broken off and preserved."

We do not see how this wide spread coincidence between the Mosaic account of Noah's deluge and tradition, not merely as to the fact of such a catastrophe, but also in regard to circumstances of a very peculiar character, can be accounted for philosophically without supposing them all to refer to the same event; and that too, the deluge described by Moses. Partial and local deluges have, indeed, happened in various parts of the world, so extensive and destructive as to make a deep impression on the minds of a whole people. Such was the deluge in Syria in the year 1095, which destroyed many lives; also that in Friesland in 1164; and that in the same country in 1218, which drowned 100,000 persons; also those in Netherlands in 1421, and 1727, which made striking ravages. But whence is it that we find the ark so frequently mentioned as the vessel in which the survivors were preserved, when it would be more natural to imagine them rescued in a vessel of the ordinary form? Still more remarkable, whence the notion of sending out the dove and the raven, to ascertain whether the earth was dry, when it would be more

natural to infer that the inmates of the ark need only look out upon the earth's surface, to determine whether the waters had retired? And why is the deluge always thrown back into the earliest and the fabulous periods of a nation's history? Admit these traditions to be all founded upon the Noachian deluge, and all difficulties vanish; but deny this identity, and we need a miracle, greater than would be required for a universal deluge, to resolve them.

7. Finally, the deluge of Noah seems to have formed, in a good measure, the ground-work of heathen mythology. Noah and his sons, the ark, the dove, the raven, and the rainbow, may be found incorporated into a large part of the characters, ceremonies, and mysteries of idol worship. It cannot be expected that we should here go into the detailed proof of this position. This has, however, been already done with great ability and industry, by Bryant, in his *New System, or Analysis of Ancient Mythology*,* and by his disciple Faber, in the *Mysteries of the Cabiri*. We can only state the leading results to which their researches have conducted them.

Noah and his sons may be distinctly recognized in the character of Atlas, Saturn, Dionusos, Inachus, Janus, Zeus, and many other gods and demi-gods among the Greeks. Thus, because Noah planted the vine and invented fermented liquors, he was called Zeuth, which signifies ferment, or leaven. In the East, Noah was called Noas, Noasis, Nusus and Nus. Hence the Greek Dionusos, the prototype of the Latin Bacchus, whose name has been generally supposed to be derived from Διὸς, the genitive of Ζεὺς, and Νύση, a city of India; but it is more probable that the city took its name from Nusus; since there were many cities by that name, as well as mountains, in various parts of the world, mostly distinguished, however, for the cultivation of the vine. This Dionusos the Greeks made a great warrior, "who went with an army over the face of the whole earth; and taught mankind as he passed along, the method of

* In three volumes quarto, London 1775.

planting the vine; and how to press out the juice, and receive it in proper vessels."*

Such an allusion to the character, and some of the most striking incidents in the life of Noah, can hardly have been accidental. In the ancient sacred mysteries, also, as well as in the histories of the individual who survived some terrible catastrophe, we find frequent reference to the door of the ark, and the imprisonment of Noah within it for a time. "The entrance through it," (the door) says Bryant, "the ancients esteemed a passage to death and darkness; but the egress from it was represented as a return to life. Hence the opening and shutting of it were religiously recorded. And as the stay in the ark was an intermediate state between a lost world and a world renewed, this was also alluded to in their hieroglyphical representations. We accordingly find Janus described with two faces; having a retrospect to what was past, as well as a view forward to what was to come. They styled him Patulcius and Clusius, in allusion to the history above given," &c. "The person preserved is always mentioned as preserved in an ark. He is described as being in a state of darkness, which is represented allegorically as a state of death. He then obtains a new life which is called a second birth, and he is said to have his youth renewed. He is, on this account, looked upon as the first-born of mankind, and both his antediluvian and postdiluvian states are commemorated, and sometimes the intermediate state also is spoken of."†

Κικλήσκω Διόνυσον, ἐριβρόμον, εὐαστῆρα,
Πρωτογόνον, διφυῆ, τριγόνον.‡

The Triad (Ἀμελείκιος Τριάς) of Plato, Proclus, and other ancient writers, Bryant supposes, with much plausibility, to have been derived from the deification of the three families of which Noah was the head. It is well known that this has been supposed to have re-

* Diodorus Siculus, L. 3.

† Bryant's Analysis of Ancient Mythology, Vol. 2, p. 255, and 209.

‡ Orphic Hymn, 29, p. 222, as quoted by Bryant.

ference to the Trinity of the Bible; but other parts of the writings of these authors show that they had no idea of such a doctrine. And in other connections the patriarch and his three sons are frequently alluded to by the ancient mythologists.

In the ceremonies of heathen worship, the ark was a very conspicuous object. There was the sacred Baris of the Egyptians, made use of in celebrating the rites of Osiris; the ship of Iris at Rome, carried yearly in procession, and the sacred cups in the form of boats, called Cymbia and Scyphi, which were used in a similar manner. The deification of the ark, or rather of the genius of the ark, is very manifest in the names and characters of numerous heathen deities. The ark was distinguished by the terms Theba, Baris, Arguz, Aren, Arene, Laris, Boutus, Boeotus, Cibotus, &c. And from these names were formed different divinities. But as the terms have various degrees of correspondence, a relation more or less remote was supposed to exist between the deities formed from them. Sometimes we perceive a confounding together of the ark and Noah; but this is not unexpected, for the whole of the heathen mythology consists of an absurd mixture of truth with error.

In this connection the famous Ogdoas of the Egyptians should be mentioned. This consisted of eight persons sailing together in the sacred Baris or ark. And there is not small reason for believing that the famous Argonautic Expedition, celebrated by the Greeks, was fabulous, and that its history was in fact derived from the history of the Noachian deluge.

Among other mementos of this catastrophe incorporated into ancient mythology, we find the dove, the raven, and the rainbow. The latter, having been constituted the token of a covenant between God and man, according to Moses, was held in uncommon regard for many ages. But the dove is found in almost all the mythological histories. It was regarded as a peculiar messenger of the gods, and the emblem of peace and good fortune. On the other hand, the raven, which unlike the dove disappointed the hopes of Noah by

never returning to the ark, was generally regarded as a bird of ill omen. Among the ancient Amonians the name of the dove was Iön, Iönah, or Iönas; hence the Ωιαϛ of the Greeks. This bird was assumed by the Babylonians for their national ensign, having been depicted upon their military standards. They were hence styled Iönim, or children of the dove, and their city Iönah.* It was a custom among the ancient mariners to let fly from the ship during a voyage, a dove or a pigeon, in order to predict by its movements the success of their voyage. It was thought to be the best time for sailing when the sun and the seven stars near the head of Taurus were in conjunction. Hence these stars are called Peleiades or Pleiades, the doves. The goddess Venus appears to have been the ancient Iönah; and hence in her history are numerous allusions to the dove of Noah and the deluge.

The mythologies of other nations, besides that of Greece and Rome, to which thus far we have chiefly alluded, afford similar allusions to the Noachian deluge. We find them, for instance, in the histories of the Phenician Sydyk, Dagon, and Agmenes; the Assyrian Derceto and Astarte, the Egyptian Isis, Osiris, Sesostris and Oannes: the Chinese Fohi and the Hindoo Menu, Buddhu and Vishnu. But we will not go into details; for our object under this last head of argument is to give the reader an idea of its nature, rather than of its force, when presented in all its details. On such a subject there is, indeed, much room for the play of a fertile imagination; but the allusions are too striking often, and the coincidences too remarkable, to permit us to impute all to fancy; and they justify us in coming to the conclusion, that the deluge of Noah formed a principal ground-work of ancient mythology. Fruitful as is the human imagination, it needs realities for the basis of its airy creations. And we may be sure that the most remarkable and impressive events in a pagan nation's history will constitute the frame-work of its religion. Hence in the Sandwich Islands, since volcanic

* These titles are given in Jeremiah xxv. 38, also xlvi. 16, and l. 16.

phenomena are more terrific and recent than the last deluge, they give the character to the mythology recently prevalent there. The truth on this subject is very clearly and briefly stated by Lactantius: Non res ipsas gestas finxerunt poetae; sed rebus gestis addiderunt quendam colorem.* "The poets did not invent the facts, but gave them their colouring."

With all these evidences before us of an identity of origin for the vast number of traces of diluvial agency among the traditions of all nations, we cannot hesitate to admit the long cherished opinion, that nearly all of them sprung from the deluge of Noah as recorded in Scripture. For among all the histories of deluges that exist, not one can compare for a moment in verisimilitude with the Mosaic,—all others have so much of palpable absurdity about them as to throw them at once into the class of fabulous histories: whereas the Mosaic is entirely consistent with itself, and contains no improbabilities. If, therefore, we have to select one of these histories as the parent of the rest, the Mosaic account must be chosen, apart from all considerations of its inspiration. And when we have once admitted this to be true, we have only to suppose it to have been conveyed down to the present time through the various winding and muddy currents of tradition, semi-barbarism, and false religion, and we shall have presented to us just such distorted representations of diluvial action as heathen mythology and tradition actually exhibit before us. On this theory we get a satisfactory account of these endlessly diversified traditions and histories; but on every other supposition we are involved in difficulty, confusion, and absurdity. The true spirit of induction, then, should lead us to acquiesce in those views that are most natural and consistent. Nor can we believe that philosophical minds would have for a moment admitted that the various histories and traditions on this subject describe different local deluges, did not such an hypothesis best comport with their geological theories or anti-biblical prejudices.

* De Falsa Relig. L. 1. C. 2

2. *We shall now proceed to give a brief history of opinions respecting the nature, origin, effects, and connection of the historical and geological deluges.*

We de not find much on this subject that is important previous to the Christian era. Some of the heathen philosophers did, indeed, speculate as to the origin and effects of those cataclysms that were supposed to have occurred in the fabulous periods of their country's history; yet, for the most part, the causes assigned were either supernatural, or merely conjectural: just such as we might expect in the absence of all accurate ideas of geological science. In at least two of the ancient writers, we find principles advanced on the subject of geology not to be despised, even in the present state of the science: I refer to Pythagoras and Strabo. Says the latter, "It is not because the lands covered by seas were originally at different altitudes, that the waters have risen, or subsided, or receded from some parts and inundated others. But the reason is, that the same land is sometimes raised up and sometimes depressed, and the sea also is simultaneously raised and depressed, so that it either overflows, or returns into its own place again." He proceeds still further with the illustration of this thought, and says, "It is not merely the small, but the large islands also; and not merely the islands, but the continents, which can be lifted up together with the sea, and both large and small tracts may subside," &c. This is the theory which, at the present day, is probably more widely adopted than any other to explain the diluvial catastrophes, and other allied phenomena which have occurred upon our planet.

Among the ancient Jews there was not enough of scientific cultivation to lead to any refined speculations concerning the Noachian deluge, except perhaps some dreams unworthy of notice in the spirit of the Talmud. Nor did the Christian world, for several centuries, exhibit any peculiar interest in the subject. Physical science seems to have been first revived by the Saracens in the eighth century; and in the tenth century we find some respectable Arabian writers upon geology, espe-

cially Omar "the learned," who wrote a work on "the Retreat of the Sea." This work, however, was thought by the Mohammedan doctors to be opposed to the Koran, and he was obliged to retract his opinions. The Koran can scarcely be said to have any cosmogony, except a slight notice of the creation, which occupied six days, and also of the deluge, which is passed over with a slight notice. A strange fable, however, derived from the Persian magi, is adopted, which represents the waters as poured out of an oven, or, as the Persians have it, from the oven of an old woman.

It was not till five centuries after this period, that geological inquiries began to excite any interest in the nations of Christendom. In the beginning of the sixteenth century, some excavations at Verona brought to light numerous fossil shells, and an animated controversy arose as to their nature and origin. One point of controversy was, whether these remains were real animals, or only *simulacra*, produced by a certain "plastic force," or "*materia pinguis*," existing in the earth. The second point was, whether they were not deposited by the deluge of Noah. Fracastoro, with great ability, maintained their animal origin, and denied that Noah's deluge could have brought them into their present situations. Nevertheless, the majority were of an opposite opinion; and even to this day, although the question has been agitated for 300 years, and the views of Fracastoro have been again and again shown to be correct, many able and learned men adhere to that opposite opinion with great confidence. We might quote in proof of this a multitude of able writers; but we will refer only to a few among the most recent. "It may also be observed," says the Encyclopedia of Religious Knowledge, "that in the regions far remote from the Euphrates and Tigris, viz. Italy, France, Switzerland, Germany, England, the United States, &c. there are frequently found in places many scores of leagues from the sea, and even in the tops of high mountains, whole trees sunk deep under ground, as also teeth and bones of animals, fishes entire, sea-shells, ears of corn, &c. petrified,

which the best naturalists are agreed could never have come there but by the deluge."* "Equally certain," says the Evangelical Church Journal of Prussia,† "must the fact of a former flood, overflowing the mountains, appear to the naturalist, (even independent of the Bible, and of the traditions of many ancient nations agreeing with it,) when he finds millions of sea-shells upon the highest mountain tops," &c. Even Rees' Cyclopedia states, and without correction, that "the present external surface of the earth, its internal constitution, the arrangements of its various strata, the remains of marine animals and petrified shells found at great distances from their original habitation, incorporated with the earth, or on eminences far elevated above the level of the sea, &c. have been alleged as existing monuments of a deluge, and evidences of its universality."‡ This, however, was written nearly thirty years ago. But no such apology can be made for Mr. Kirby, who in his late Bridgewater Treatise, among other absurdities respecting the deluge, says, that "the heavens and earth *which are now*, are different from the heavens and earth which were destroyed at the deluge; and the latter has evidently been reconstructed, and vegetable and animal remains have been mixed with the dislocated materials and as it were *detritus* of the original world."§ That such opinions should be advanced at this day by so scientific a man, can be explained only by a statement which he has himself candidly made in the same work:—"My own knowledge of geology and its principles as now laid down," says he, "is too slight to qualify me to compare them with what has been delivered in Scripture on the subjects here alluded to:"—that is, the general subject of the deluge. What a pity after such confession, that he should have undertaken to theorize upon some of the most difficult

* Article *Deluge*, Brattleboro, 1835.

† See Literary and Theological Review. Vol. 1. p. 124. New York, 1834.

‡ Article *Deluge*.

§ Kirby's Bridgewater Treatise, p. 493. Philadelphia, 1836.

parts of that science, and to defend the wild hypothesis of the physico-theologists of by-gone centuries!

After all, however, the argument under consideration respecting marine organic relics, when put into a popular form, is very striking, even to logical minds that are not acquainted with the whole history of organic remains. Immense quantities of marine animals are found petrified on high mountains all over the globe: "ergo," says the physico-theologist, "they must have been deposited there by the deluge:" "ergo," says the geologist, "those mountains must once have constituted the bottom of the ocean; but other facts prove that it could not have been at the deluge." "Yet the Scriptures mention no other period since the creation of animals," replies the physico-theologist, "when the mountains have been covered with the ocean, except at the time of the general deluge." "Here is another mistake," answers the geologist; "and it is one that was urged for three centuries as an infallible dogma, whose truth was to be received on authority, and not to be inquired into. In the first place, it was taken for granted that all the animals that ever inhabited this globe were produced during the six days of creation described in Genesis; and then, as the deluge is the only other important geological event on the sacred records, all phenomena that cannot be referred to the six demiurgic days must be referred to that event. But it now appears that the fossil animals and plants are so different from existing races that they could not have been contemporaries; so that we must seek in that undescribed interval between "the beginning" and the six days' work, for the time when they had their existence, and regard the Scriptures as entirely silent concerning them, because their history could have no bearing upon the objects of revelation. In that interval our present continents might have formed the bottom of the ocean, and have been receiving in their bosoms the numerous oceanic relics which now appear upon the tops of the mountains, because volcanic force has lifted them above the waters."

But it is not our intention in this place to enter into

this argument formally: though it is obvious that the authority by which this popular evidence of the deluge from organic remains is defended, is quite too respectable to allow us to pass it over without a thorough discussion under a more appropriate branch of the subject. Among practical geologists, however, the question has long been settled; and if such happen to be sceptical concerning the Scriptures, the only effect of seeing this popular argument presented as an evidence of the truth of the Mosaic account, is, to produce the impression that all other evidences in its favour are alike baseless. We have long been satisfied, however, that although this point has been argued from the days of Fracastoro to the present, geologists have yet, especially in our own country, a severe contest to wage, before the truth will gain a permanent triumph,—that is, before theologists shall cease to bring forward marine petrifactions in solid rocks as evidence of Noah's deluge. It is one of those cases where the popular view appears very clear, while the scientific view makes little impression, because it is only imperfectly understood. Hence we do not expect the latter will be admitted until much more acquaintance with geology, than at present prevails, shall be diffused through the community. It is consoling, however, to reflect, that not a little advance towards the truth on this subject has been made within the last fifty years. For during the eighteenth century, to deny that organic remains were the result of Noah's deluge, was thought to be equivalent to a denial of the truth of the Bible; and with the physico-theological school of writers, this position was regarded as the *articulus stantis vel cadentis Ecclesiae.*

The writers to whom we have just referred, having assumed that all the geological changes that appear to have taken place in the earth's crust were produced by the deluge, and perceiving that the solid strata to a great depth must have been once in a fluid state, in order to envelop so many relics of organic nature, very naturally adopted the hypothesis that the earth's crust was actually broken up and entirely dissolved by that catastro-

phe, and subsequently reconsolidated. This idea entered as an important element into several of the most famous theories of the earth, contained in works on the deluge that were published during the eighteenth century, such as those of Woodward, Burnet, Scheuchzer and Catcott. The first named writer imagined "the whole terrestrial globe to have been taken to pieces and dissolved at the flood, and the strata to have settled down from this promiscuous mass as any earthy sediment from a fluid."* About the same time, or rather a little earlier, between 1680 and 1690, Bishop Burnet published his famous "Sacred Theory of the Earth,"† in which he improved upon the theory of Des Cartes, that the earth was originally perfectly round and equal, without mountains or vallies. Burnet imagined it to be a smooth orbicular crust resting upon the face of the abyss. This crust, being heated by the sun, became chinky, and in consequence of the rarefaction of the enclosed vapours it was burst asunder and fell down into the waters, and so it became dissolved, while the inhabitants perished. Burnet's work is beautifully written, and although extremely visionary, it has had more popularity perhaps than any similar work. The following paragraph will give our readers an idea of his manner: "In this smooth earth were the first scenes of the world, and the first generations of mankind; it had the beauty of youth and blooming nature, fresh and fruitful, and not a wrinkle, scar, or fracture in all its body: no rocks nor mountains, no hollow caves, nor gaping channels, but even and uniform all over. And the smoothness of the earth made the heavens so too; the air was calm and serene; none of those tumultuary mo-

* Essay towards a Natural History of the Earth.—Preface.—1695.

† This work was originally published in Latin, with a title that provokes a smile: "The Sacred Theory of the Earth, containing an Account of the Original of the Earth, and of all the general Changes which it hath already undergone, or is to undergo, till the Consummation of all Things." In the English copy before us, however, printed as late as 1816 in London, this title is altered so as to be comparatively modest, and notes more extensive than the text are added from various writers on Natural Religion.

tions and conflicts of vapours, which the mountains and the winds cause in ours: it was suited to a golden age, and to the first innocency of nature."*

This notion of a dissolution and reconsolidation of the earth at the deluge continued to be a favourite with philosophers for nearly a century. In 1761 Catcott's "Treatise on the Deluge" appeared. It was a work of no small merit; but "the dissolution of the earth" held a prominent place in it. And it is amusing as well as instructive to see how easily he leads himself into the belief that the Scriptures teach this doctrine. Take a few examples of his mode of interpretation. After having persuaded himself by the help of an extract from Hutchinson's famous work entitled "Moses's Principia," that the *windows of heaven* mentioned in the account of the deluge mean "passages of the airs" through the cracks in the earth's crust, he says: "As there are other texts which mention the dissolution of the earth, it may be proper to cite them. Psalm xlvi. 2, *God is our refuge;—therefore will we not fear though the earth be removed* [בִּמּוֹט be changed, be quite altered, as it was at the deluge]—God uttered his voice, the earth *melted* [flowed, dissolved to atoms]. Again, Job xxxviii. 9, *He sent his hand* [the expansion, his instrument, or the agent by which he worked] *against the rock; he overturned the mountains by the roots; he caused the rivers to burst forth from between the rocks* [or broke open the fountains of the abyss]. *His eye* [symbolically placed for the light] *saw* [passed through or between] *every minute thing* [every atom, and so dissolved the whole]. *He* (at last) *bound up the waters from weeping* [i. e. from pressing through the shell of the earth, as tears make their way through the orb of the eye; or as it is related, Gen. viii. 2, *He stopped the fountains of the abyss and the windows of heaven*]. *And brought out the light from its hiding-place* [i. e. from the inward parts of the earth from between every atom, where it lay hid, and kept each atom separate from the other,

* Sacred Theory of the Earth, p. 76. London, 1816.

and so the whole in a state of *dissolution;* his bringing out those parts of the light which caused the dissolution would of course permit the agents to act in their usual way and so reform the earth.] 2 Esdras viii. O Lord, whose service is conversant in wind and fire; whose word is true; whose look drieth up the depth, and indignation maketh the mountains to melt away which the truth witnesseth, [which the word of God and the present natural state of the earth bear witness to.]"*

It seems truly surprising to us at this day, who view the subject no longer with the chromatic optics of physico-theology, how such an exposition as this could satisfy able and logical minds that the Scriptures teach the dissolution of the earth at the deluge. Still more surprising is it, how such a man as Bishop Burnet could have thought it consistent with Scripture, to maintain that the primitive earth was only "an orbicular crust, smooth, regular, and uniform, without mountains and without a sea,"† when it is so definitely stated that *the waters under the heavens were gathered together unto one place, and the dry land appeared;* and that *God called the dry land, earth; and the gathering together of the waters called he seas:* And further, when it is stated that there were rivers in this primitive world, implying inequality of surface, and also, when the deluge came, it is said that *all the high hills that were under the whole heaven were covered.* Yet so far was such a theory from being regarded as opposed to the Scriptures, that it was long considered the orthodox view; while those who opposed it were looked upon with suspicion, as being sceptics. Here is, indeed, an instructive lesson, both for those geologists of the present day, who first frame their hypothesis and then endeavour to torture the Bible to support them; and also for those theologists, who denounce geological theories as anti-biblical, while they admit opposing theories that strike at the root of all revealed truth.

* Treatise on the Deluge, p. 43. London, 1761.

† Rees' Cyclopedia, Article *Deluge.*

Will it be believed that a really able and scientific man, writing by appointment of the President of the Royal Society in England, in the year 1835, should have revived and adopted, with slight modifications, the essential features of this hypothesis of dissolution and reconsolidation of the earth by the deluge! Yet Mr. Kirby has done it in his Bridgewater Treatise, already referred to. He does not, indeed, contend for the smooth, orbicular crust of Burnet; yet he does undertake to show, both from reason and Scripture, that there is a vast abyss of waters beneath the crust of the globe, or under the earth, distinct from the ocean, though in communication with it; and he "contends that the principal reservoir from which they (rivers) are supplied, has its station *under the earth.*" Nay, he inquires, "whether besides the unexplored parts of the surface of the earth, and of the bed of the ocean, we are sure that there is no receptacle for animal life in its womb?" And, after a long argument, he says, "All circumstances above stated being duly weighed, and especially the discovery of a species in the depths of the earth, related to one of the fossil ones, I trust that my hypothesis of a subterraneous metropolis for the Saurian, and perhaps other reptiles, will not be deemed so improbable and startling as it may at the first blush appear." In this 'metropolis' he imagines those enormous fossil Saurians, hitherto regarded as extinct, may still be living; while our "smaller ones may be regarded as inhabiting the outskirts of the proper station or metropolis of their tribe." This is certainly one step in absurdity beyond the dreams of a visionary of our own country and our own times, well known for his speculations respecting the interior of the earth.

The exegetical skill by which Mr. Kirby makes the Scriptures teach the doctrine of a subterranean abyss of waters, and a subterranean metropolis of animals, reminds us of that which we have just presented from the treatise of Catcott. Thus, on the passage from the Apocalypse, v. 13, "And every creature which is in heaven and on the earth, and under the earth, and such

as are in the sea, and all that are in them," &c., he remarks—" Some interpreters understand this passage as relating to those men that were buried under the earth or in the sea; but admitting they were meant in the *spirit*, the creatures in general are expressed in the *letter*, and therefore the outward symbol must have a real existence, as well as what is symbolized."* So, on the same principle, we suppose " the great red dragon, having seven heads and ten horns, and seven crowns upon his head," mentioned in Rev. xii. and " the beast rising up out of the sea, having seven heads and ten horns, and upon his horns ten crowns, and upon his heads the name of blasphemy," described in Rev. xiii.: these being " outward symbols, must have a real existence."

On the passage in Ps. xlv. " Though thou hast sore broken us in the place of dragons, and covered us with the shadow of death," Mr. Kirby remarks—" In these words, *the place of dragons*, and *the shadow of death*, evidently mean the same thing; and the object of these metaphors is to express the lowest degree of affliction, depression, and degradation, equivalent to being brought down to hell, or hades, in other passages. The *shadow of death*, properly speaking, is in the hidden or subterranean world. This appears from the passage of Job, before quoted, in which *the abyss*, *the gates of death*, and the gates of *the shadow of death*, are used as synonymous expressions, Job xxxviii. 17. The place of dragons, then, according to this exposition, will be subterranean. In another Psalm, David couples *dragons* and *abysses*, Ps. cxlviii. 7."†

Mr. Kirby's exposition of the phrase *windows of heaven*, which were opened at the time of the deluge, corresponds with that already alluded to as given by Catcott and Hutchinson. He here quotes a criticism from his " venerated friend, the late Rev. William Jones of Nayland, well known for his knowledge of the Hebrew, and the variety and ability of his researches on every subject connected with the interpretation of the

* Bridgewater Treatise, p. 13. † Idem, p. 14.

Scripture." "We suppose, then," says Mr. Jones, "that the air was driven downwards for this purpose, through those passages which are called *windows of heaven*. These may seem very obscure terms to express such a sense by; but *heaven* is the *firmament*, or expanded substance of the atmosphere, and *windows*, as they are here called, are holes or channels of any kind. The same word is used for chimneys through which smoke passes, and for the holes, probably cliffs of a rock, in which the doves of the eastern world have their habitation." Mr. Kirby adds—"It strikes me as not very improbable, that the term I am speaking of may allude to *volcanoes* and their *craters*, which may be called the *chimneys* of this globe, by which its subterranean fires communicate with the atmosphere, and by which the air rushing into the earth, when circumstances are favourable, may possibly act the part of the fabled Cyclops, and blow them up previous to an eruption. Thus they become literally channels, or chimneys, through which the matter constituting the firmament passes, either *from* heaven, or in an eruption *towards* heaven."

Through these *windows of heaven;* that is, cracks and volcanic rents in the earth; Mr. Kirby supposes the waters within and around the globe, rushed outward and inward, alternately, until they had "subdued and destroyed the primitive earth, till they reduced it to the state, for the most part, in which we now find it." (Br. Treat. p. 15.) This process, however, is represented by him rather as one of comminution than of dissolution, and he supposes some part of the crust of the globe to have resisted comminution; for he states, "the vestiges of such clefts in the earth's crust, (that is, we suppose, *the windows of heaven)* are still to be traced in many places." (Br. Treat. p. 486.) In relation to the extent of the destruction, he says, "With respect to the earth itself, when we consider the violent action of the ascending and descending waters, and of the firmament rushing downwards; the disruptions, dislocations, introversions, comminutions, deportations here and there of the original strata of the crust of our globe, can scarcely be con-

ceived, and are still more difficult to calculate and explain exactly" (Br. Treat. p. 488.)

The formation of the present crust of the globe from the detritus of the old, Mr. Kirby imputes to the descending or subsiding waters; and thus adopts the last item of the old physico-theological reverie on this subject. "The putting together again, of the dislocatd remains of the primeval earth, must have been an important part of the office of the subsiding waters." "The object now was, not disruption, and dislocation, and destruction, but to form anew the earth and its heavens, which had been thus destroyed, and by the addition of a vast body of fresh materials not entering into the composition of the old crust of the former, to render it materially different from it." (Br. Treat. p. 491.)

It it not necessary to go into a formal exhibition of the absurdity of such views as these. For unless a new school of physico-theologists should arise, and geological science as well as biblical criticism, should revert to their condition one hundred years ago, they will not be adopted. To the taste as well as the science of that age, they are admirably adapted, and the same may be said of nearly all those parts of Mr. Kirby's treatise, that are connected with geology. We do no injustice to that gentleman, by saying this; while justice to the cause of science, as connected with religion, requires us to do it. But it is a painful duty. We have taken a deep interest in the Bridgewater Treatises, and were thankful that we were going at last to have a series of works by men of the first scientific eminence in Europe, which we could put into the hands of scientific sceptics, while they should not be able to say, that these writers defend religion only because they do not understand philosophy. But so far as the geology of Mr. Kirby's work is concerned, we are entirely disappointed; and we feel it to be our duty to say that such exhibitions can have no other than a bad effect upon the cause evidently so near Mr. Kirby's heart; the defence of natural and revealed religion. For the inevitable effect upon the sceptical geologist, will be to make him

throw aside the work, and we fear the whole series, in disgust. We have before us a letter from one of the ablest living geologists of this description, which well exhibits the effects of such productions. "It gives me pain," says he, "to find a man so estimable in every respect as ———, compelled to cling to theories impossible to defend, from reasons unconnected with science. It has injured his well-earned reputation, and I think has injured the great cause he has at heart, the interests of the Christian religion; for this must be the effect of connecting it with opinions which are manifestly no more than the best conclusions that wise and good men of former days, were induced to adopt, when they had but few facts, inaccurately observed, to reason from." These remarks, it ought to be stated, were addressed to a believer in revelation.

There is another bad effect resulting from the adoption of such untenable and exploded theories by a standard writer. The greater part even of educated men have not the leisure requisite for pursuing the subjects of natural science so accurately as to be able to form independent opinions upon difficult questions connected with it. Hence when a man like Mr. Kirby, of acknowledged distinction in science, and evidently jealous for the honour of natural and revealed religion, advances opinions on the connections of science with revelation, they will have a wide influence and be extensively adopted. And if they happen to be wrong, they will powerfully arrest the progress of truth. Now Mr. Kirby's reputation as an entomologist, and perhaps we may add also as a helminthologist, is deservedly high. But this does not prove that he is at all qualified to decide difficult geological questions; especially when he himself testifies that he is not. Yet his opinions on geology will have nearly as much influence, except among geologists, as if he were well acquainted with the science. Nay, with not a few there exists no small jealousy respecting the views of geologists, as if hostile to revelation; and such will be very glad to range themselves under the banner of a leader in natural history,

especially of one whose great object appears to be to bring philosophers back to the word of God, who, he maintains, "with the exception of a single sect,* *who perhaps have gone too far in an opposite direction*, have made little or no inquiry as to what is delivered in the Scriptures on physical subjects, or with respect to the causes of the various phenomena exhibited in our system, or in the physical universe." (Br. Treat. Int. p. xl.) So that it would not be very strange if there should be quite a revival in our day of the doctrines of physico-theology; so many germs of which are scattered through Mr. Kirby's work. And if he can speak so mildly and hesitatingly of the extravagances and dangerous doctrines of Hutchinson, it requires but a slight knowledge of human nature to understand that some of his followers would ere long adopt them.

But we will detain our readers no longer on this subject; for we had no intention of reviewing Mr. Kirby's work. We did intend, however, to express our opinions freely; and we now resume the history of opinions respecting the deluges of history and geology.

Writers upon the deluge early perceived the difficulty of finding water enough on the surface of the globe to cover its continents. Hence they resorted to subterranean abysses of vast extent; and, for a long time, this opinion seems to have been taken for granted: so that philosophers had little to do, except to point out a method by which these internal waters could have been forced out so as to deluge the surface. Hutchinson, Catcott, and recently Kirby, imagined, that as the waters were driven out, by internal heat according to the latter author, and by the pressure of the air on the surface according to Catcott, the air would rush inward to supply its place, and to prevent the falling back of the waters; and though such an effect must have taken place in defiance of the laws of gravity, yet it corresponds very well with the other parts of their hypothesis, and Mr. Kirby has advanced a principle which makes such ap-

* The Hutchinsonians.

parent inconsistencies no real inconsistencies. "It must always be kept in mind," says he, "that this was not an event in the ordinary course of nature, and a result of the enforcement of her established code of laws, but a miraculous deviation from it, in which their action was suspended, and in consequence of which, perhaps, some were abrogated, and new ones enacted in their room." (Br. Treat. p. 15.) We have no objection to considering the Noachian deluge as miraculous. But after this admission, it seems very absurd to attempt, as these authors do, to explain the manner in which the event took place, any further than to state the facts just as they are delivered to us in the inspired record; and then, when their hypotheses are shown to be in violation of the laws of philosophy, to escape from the difficulty, by terming the event a miraculous one. But if we have any reason to suppose this event was brought about by natural agencies, then our reasoning concerning their *modus operandi* must be in accordance with the known laws of nature. We ought either to discard all reasoning on the subject, or to reason according to the principles of correct philosophy.

Other writers have invented more ingenious expedients for forcing the water out of the bowels of the earth. Hooke, a distinguished mathematician and philosopher, whose posthumous works were published at the commencement of the eighteenth century, imagined the globe was compressed so as to force the water out, just as the juice of a lemon is driven out by squeezing it in the hand; and thus, to say the least, he showed how the depressed portions of the surface might have been inundated. Subterranean agencies, according to him, the same that produce earthquakes, occasioned the depressions and elevations of the crust, which caused the waters to flow out.

Ray, a distinguished naturalist and the contemporary of Hooke, had recourse to the hypothesis of a shifting of the centre of gravity of the earth, somewhat after the manner in which Dr. Halley explains magnetism by a mass of metallic iron in the earth, which has a revolu-

tion distinct from that of the earth, and is of irregular form. As the attracting centre changed, it would cause the waters successively to deluge and desert the different parts of the surface.

Sir Henry Englefield has made some curious calculations to show how a slight expansion of the waters within the globe might produce a general deluge. He assumes that the solid crust of the globe is 1000 miles thick, and that beneath this is an abyss of waters 2000 miles thick, leaving a solid central nucleus 2000 miles in diameter. Assuming that the temperature of the whole globe before the deluge was 50° (Fahrenheit), and that from some cause it was suddenly raised to 83°, he finds, since water expands 1-25th of its bulk from freezing to boiling, that this increase of heat would be sufficient to deluge the earth. If the cause of the elevation of the temperature were then removed, the waters would contract to their original bulk, and leave the continents again dry. The great difficulty with this hypothesis, besides its unsupported assumption of a vast internal ocean, is, that several of its conditions (as, for instance, the accession to, and subsequent abstraction of temperature from the waters) would demand as great an exercise of miraculous power, as to produce a deluge without the intervention of means.

In our own day and country, Dr. Silliman has suggested a very ingenious hypothesis to bring the waters of the earth's abysses over the dry land. He supposes vast galvanic arrangements to exist in the bowels of the earth, which might have generated vast quantities of hydrogen, oxygen, and carbonic acid by decomposition, and that these gases, occupying the upper portions of subterranean cavities, would, as they accumulated, force the waters out, and cause them gradually to overflow the land; but after their escape, the waters would flow back again into these internal reservoirs.*

This notion of vast subterranean accumulations of water, however, though quite plausible at the beginning

* American Journal of Science, vol. iii. p. 51.

of the present century, has probably been abandoned by nearly every able geologist, since the recent astonishing discoveries concerning central heat. Ingenious, therefore, as several of the modes are that have been mentioned for forcing out these waters, proposed, though they have been, by men of the most powerful and logical minds, it is no longer necessary to spend any time in proving them unfounded.

The famous Dr. Halley ascribed the deluge to a comet impigning obliquely against the earth. This would change the axis of rotation as well as the length of the day and the year; and the powerful agitation thus given to the waters, would drive them with violence over the dry land. This change of the earth's axis, whereby the former equatorial regions have been brought into the northern hemisphere, has been a favourite notion with cosmologists ever since the time of *Allessandro degli Alexandri*, who suggested it in the fifteenth century; and even in our day it has been advanced with confidence. It was among the fancies of Dr. Samuel L. Mitchell of New York,* although both Newton and La Place had shown its extreme improbability; and we find it in the recent *Geologie Populaire* of M. N. Boubee of France.

Whiston improved upon this cometic theory of Halley. He thought that the mere appulse of a comet to the earth sufficient to produce the deluge, without actual collision. And by a display of mathematical learning of a high order, he made it probable that a comet did actually pass near the earth just previous to the deluge. This, he thought, would produce a gradually increasing tide, both in the waters upon and within the earth, until the comet had reached its nearest distance from the earth, when the waters would gradually decrease. This theory, certainly, seemed very plausible; and even Mr. Greenough, late President of the London Geological Society, although he does not avow his belief in it, yet shows it more favour than any other, and says, "We need not be deterred from embracing that

* Cuvier's Theory of the Earth, p. 410. New York, 1818.

hypothesis, under an apprehension that there is in it any thing extravagant or absurd."* However, since the time when he advanced this sentiment, he has entirely changed his opinion respecting the geological evidence of a general deluge, as we shall see further on.

It is true, that some twenty years ago there was no extravagance or absurdity in supposing that the appulse of a comet to the earth, and especially its collision with our globe, would produce a terrific effect upon its fluid portions, and even solid parts. But from more recent observations it appears certain, that some comets, and probably all, consist of matter so attenuated, that were our globe to come into direct collision with one, it is doubtful whether we should be conscious of it. They have probably "no more solidity or coherence than a cloud of dust, or a wreath of smoke,"—"through which the stars are visible, with no perceptible diminution of their brightness."† These discoveries, admitted now by the ablest astronomers, have doubtless given the final quietus to this cometic theory of the deluge, though we perceive that some geologists on the continent of Europe still cling to this hypothesis.

Another hypothesis that has been very much in vogue, and has received the support of several able geologists, supposes the sea and land to have changed places at the deluge; that the former continents were deluged by being sunk beneath the ocean, while our present continents were raised at the same time. It was adopted by Hooke in his work on Earthquakes. "During the great catastrophe," he says, "there might have been a changing of that part which was before dry land into sea by sinking, and of that which was sea into dry land by raising; and marine bodies might have been buried in sediment beneath the ocean, in the interval between the creation and the deluge."‡ These views, with the exception of that part which deposits the fossiliferous

* Greenough's Geology, p. 198. London, 1819.

† Whewell's Bridgewater Treatise, pp. 152, 153. Philadelphia, 1833.

‡ Hooke's Posthumous Works, p. 410, as quoted by Lyell.

strata between the creation and the deluge, were adopted and defended towards the close of the last century by M. De Luc, Professor of Philosophy and Geology at Göttingen.* More recently this hypothesis, just as it was described by Hooke, has been defended with no small ability of certain kind, and with the most dogmatic assurance, by Granville Penn. He assumes as demonstrated truth, that "there have been two, and only two, general revolutions in the substance and circumstances of this globe; so that all effects discoverable, or appearances discernible, which are truly attributable to general revolutions, must find their causes in those binary revolutions, or in the period of time intervening between them."† He then attempts to show, that the remains of tropical animals and plants were drifted into the northern hemisphere in the period between the creation and the deluge, and deposited so as to form the fossiliferous strata of our present continents. At the deluge, he maintains that the earth that then was, was literally destroyed, or sunk beneath the waters, while our present continents were lifted up. These views have been lately echoed by Fairholme, in a smaller work more adapted to general circulation.‡ Both of these writers belong to Great Britain,—the work of the latter only has been reprinted in this country.

The works of Penn and Fairholme, above alluded to, furnish the best example of physico-theology modernized that we have seen. They were compelled to pay so much deference to the advanced state of science at the present time, as to knock off some of the Hutchinsonian protuberances; yet they have not gone into the core of the system to make any reformation there. Their works are distinguished, in the first place, by

* Letters on the Physical History of the Earth. By J. A. De Luc, F.R.S. With Introductory Remarks, &c. by Rev. H. De La Fite. London, 1831. (See Letter 6.)

† A Comparative Estimate of the Mineral and Mosaical Geologies. By Granville Penn, Esq. In two volumes, 8vo. Second edition. London, 1825. (See Vol. 2.)

‡ General View of the Geology of Scripture, &c. By George Fairholme, Esq. 1 vol. 12mo. Philadelphia, 1833. (See ch. 6, et seq.)

great positiveness of opinion. Where the ablest geologists hesitate and wait for further light, they cut the knot at once. And yet it is quite clear from the books themselves, (we have no other means of judging,) that their knowledge of geology is mostly literary,—that is, obtained by reading. The relative importance of facts is so often presented by them in such a manner, as to betray at once their want of practical acquaintance with the subject. Nay, this is shown by their very positiveness on many points, which all working geologists know to be quite problematical. Secondly, these works are distinguished by very great severity and intolerance towards the leading geologists of the last half century. A powerful attempt is made to exhibit the Mosaical and mineral geologies as at variance in their fundamental principles; so that the one or the other must be abandoned. And in doing this, they have sadly misapprehended the views of geologists. Because the latter have imputed the changes in the earth's condition to secondary causes, they are charged with atheism; and Mr. Penn says, "It is manifest that the mineral geology, considered as a science, can do as well without God, (though in a question concerning the origin of the earth,) as Lucretius did."* Now such a sweeping charge would never have been made, had he not entirely misunderstood the geologists, or had he been practically familiar with the structure of the earth's crust. For they have only referred to second causes those changes which no man thoroughly acquainted with them would regard as miraculous, any more than he would the existence of such a city as London or Paris. And they have had no idea of doing without God, because they suppose the world to have had an earlier origin than Mr. Penn admits. For at whatever period it began to exist, it would alike require infinite power and wisdom to create and arrange it, although it may be true that some French writers have talked of the "eternal march of nature;" and one of them (Fourcroy) ranks the

* Comparative Estimate, vol. i. p. 122.

"creation of the world among the pious fictions invented by the authors of certain religious chronicles."* But *geologists*, with scarcely an exception, have decidedly and boldly opposed such views. So that even did their views lead to atheism, it ought not to be insinuated that they are actually atheists, when, in fact, the greater part of them are not even infidels. The course which Penn and Fairholme have taken, will inevitably produce among pious men, not familiar with science, a prejudice against it, and a jealousy of its cultivation. Nay, the tendency of the very title of Mr. Penn's work is calculated to array science against revelation. How disastrous such a result would be, let the painful history of the past testify. Thirdly, these works are distinguished by the adoption of very extravagant theories, and very great distortion of geological facts, as well as of the language of Scripture. They suppose the primary rocks to have been created just as we find them, for the original frame-work of the globe. The secondary rocks, they maintain, were deposited between the creation and the deluge; and the tertiary strata along with the diluvial by the deluge. This theory, of course, requires us to suppose that the antediluvian continents were sunk beneath the ocean at the deluge, and our present ones were then raised above the waters. Now none but a geologist can know what absurdities must be received, and what distortions made of facts, before such opinions can be embraced. They answered well enough for the times when physico-theology was in its glory, because then it was only a few generalities, and these very misty, that were known; and at this day they can be embraced, without a suspicion of their absurdity, by those who know but few of the details of geology. Yet to the geologist they appear a thousand times more extravagant, and opposed to facts, than any opinions that have been entertained by the cultivators of this science, and which Penn and Fairholme so violently oppose. What can be

* De Luc's Letters on Geology, p. 274.

more absurd, for instance, than to maintain that the tertiary strata were deposited by Noah's deluge,—or that the organic remains of a tropical character in high latitudes were originally drifted thither from between the tropics,—or that limestone caverns, containing the remains of tropical animals, should have been produced by desiccation, or the expansive energy of gases resulting from their putrefaction!

But these hypotheses require scarcely less perversion of the sacred records. The favourite and fundamental position taken by these authors, is, that the antediluvian continents were sunk at the time of the deluge, and new ones raised from the deep. And to prove this they lay great stress, and with no little plausibility, upon the language of God's threatening, Gen. vi. 13, *The end of all flesh is come before me, and behold I will destroy them with* (or *and*, אֶת,) *the earth*; also upon the declaration of Peter, (2 Pet. iii. 7.) *the world that then was, being overflowed with water, perished*—ἀπώλετο. To destroy any thing, may mean to annihilate it. But such cannot be the sense in these passages; for man suffered only temporal death, and even the material part of him did not cease to be. The word may also imply, to *ruin in some respects*; and since we are certain that the earth was not extirpated by the deluge, we must resort to the history of that event in Genesis, to ascertain how far the destruction extended. The account of the flood there given, is exceedingly simple and intelligible. It seems hardly possible for a sensible man to misunderstand it, unless his judgment is warped by some favourite theory. By long rain and the breaking up of the fountains of the great deep or sea, the waters are represented as gradually rising over the dry land, until all the high hills under the whole heavens are covered. Then they decreased continually, until the tops of the mountains appear; and at length the whole surface is drained and dried. Every part of the description conveys the idea impressively, that it was the waters that rose over the earth and then withdrew; and no in-

timation is given that the land previously inhabited was engulfed, and new continents brought up from the deep. Furthermore, in the second chapter of Genesis, we have a particular account of the situation of the garden of Eden; and a part of the four rivers proceeding from the garden, are the same as now exist on the globe. Indeed, we must either deny that this description is a part of the Bible, or admit that Eden was situated upon existing continents. The former alternative has been adopted by Penn and Fairholme, and that, too, upon mere conjecture, without the shadow of any evidence from ancient writers. They presume that Gen. ii. 11, 12, 13, and 14, are an interpolation—words originally written as a gloss upon the margin, and foisted into the text by some transcriber. This is a truly bold step for men who are so sensitive when geologists presume, not to strike out, but to give a more extended signification than the common one to the first verse of Genesis. This, in the matter of interpretation, is *straining at a gnat, and swallowing a camel.*

We might add here, that all the facts in geology, when rightly understood, are opposed to the idea that there has been an interchange of land and sea, except some limited examples, resulting from earthquakes and volcanoes, at so recent a period as the Noachian deluge. As we have already remarked, all the supposed evidences of such an exchange, merely show that some time or other, the land constituted the bed of the ocean. And still more opposed to geology, is the idea that the fossiliferous rocks were deposited between the time of man's creation, and the deluge. In respect to the primary rocks, also, every geologist knows that there is nearly, or quite as much evidence, of their having resulted from secondary causes, as exists in regard to the secondary and tertiary strata. We have now before us, for example, specimens of as distinct conglomerated, or pudding-stone, as is furnished by any secondary or tertiary stratum, and obtained from some of the oldest primary rocks in New England. We are compelled, therefore, both by correct geology, and by Scripture, to conclude

that sea and land did not change places at the deluge of Noah.

A writer, however, of much higher scientific character than the authors above referred to; nay, a member of the London Geological Society, has quite recently defended the essential features of the same hypothesis in an elaborate work on geology.* Dr. Ure, however, does not insist upon the entire destruction of the primitive earth, at the time of the deluge; nor does he think such destruction can be fairly inferred from the texts of Scripture which we have been considering. He takes the ground, that "the territories occupied by the human race, were permanently submerged at the deluge, —probably some great continent, corresponding to the site and area of our Pacific ocean."† He does not, however, adopt the monstrous absurdity of Fairholme, that the tertiary strata were the product of the deluge. Nor does he exhibit such positiveness of opinion, or intolerance as is shown in the "Comparative Estimate," and the "Geology of Scripture." In short, the peculiar theory under consideration is defended much more scientifically by Dr. Ure, and whenever chemical principles are concerned, he shows himself at home. But, unfortunately, he has ventured out of his appropriate sphere in attempting to solve geological difficulties. We have long sat at the feet of Dr. Ure, as our chemical instructor, with profit and pleasure; but he had better have left geology in other hands.

We have no doubt that the three living writers, whose works we have thus freely examined, and indeed we might say the same of all the authors of the physico-theological school, are sincerely desirous of vindicating revelation from the attacks of scientific sceptics, and that this desire prompted them to write as they have done. But we cannot doubt that the effect of their works on real geologists, who are sceptical, will be very

* A New System of Geology, &c. By Andrew Ure, M. D. London, 1829.

† Same work, p. 472.

unhappy. Such persons will see that these authors, certainly all of them, except Dr. Ure, do not understand the subject about which they write; and they will see a spirit manifested which will not greatly exalt their ideas of the influence of Christianity. On those who are not familiar with geology, the effect of these works must be to give them a distorted view of the science; excite prejudice against scientific men; and by giving them the impression that they understand the connection between geology and religion, when in fact they do not, prove a great obstacle to the progress of truth. Yet these works, or compilations from them by our own writers, who adopt their views essentially, are more widely circulated than those of the ablest geological authors. Hence we have felt bound in conscience, to give our opinion very freely, however little it may be regarded.

On the continent of Europe very few works have appeared of late years, on the subject of the deluge, or any other point where science connects itself with revelation. In 1821, however, there was published at Rome, in Italian, a very curious work by Jean Fortuné Zamboni, chamberlain to the pope, entitled, "A Discourse on the necessity of putting plain people on their guard against the artifices of certain recent geologists, who, under cover of their physical observations, dare to deny the history of the creation, and the deluge." This work was published in German in 1823, in Vienna; and the author maintains that "the world was created as we see it; that is, God formed at the same time in the mineral kingdom, the substances, and rocks in their perfect state, decomposed and reaggregated; and in the other kingdoms, not only individuals of every age, but even individuals sick, dead, and in a state of putrefaction."*

A curious work has lately fallen into our hands, on the subject of the connection between geology and revelation, published in French at Paris, in 1832, by

* We have not seen the work of Zamboni, but quote here the words of Boué in his *Memoires Geologiques et Paléontologiques*, Tome Premier, p. 148. Paris, 1832.

L. A. Chaubard;* who modestly styles himself, *naturaliste obscur et ignoré.* The same modest bearing characterizes the whole work; and instead of taking every possible opportunity to lash geologists in the manner of Penn, Fairholme, Cole, and other English writers, he contents himself with stating the facts of geology and of history, and leaving the reader to decide whether his peculiar views are made out. His views are, indeed, very peculiar; and for aught we know, unique. They are more fanciful than any we have met with in modern times; yet they are stated in a logical and plausible manner. He first divides all the rocks into four great formations; first, the *Terrains Primitifs;* secondly, the *Terrains Intermediaires;* thirdly, the *Terrains Secondaires,* and fourthly, the *Terrains Tertiaires de Transport.* In his secondary class, he includes the tertiary strata of other writers; and his fourth class is nearly synonymous with the diluvium of English authors, not including modern alluvium. "History," says Chaubard, "presents us in like manner with four great epochs, or four grand and different cataclysms, during which the surface of the earth may have been totally changed, or at least modified, by the influence of an immense and prodigious mass of waters, which covered and enveloped it. The first of these deluges, anterior to the existence of animals, anterior even, according to Scripture, to the creation of the universe, is that where the book of Genesis represents the earth coming out of chaos, in the most complete confusion of its elements, and influenced by the inconceivable pressure of an immense and prodigious mass of water, which covered all parts, so that the excess of it was lifted up on high, and the rest collected in basins scooped out for its reception. During this first cataclysm, the primitive rocks were formed. The second, posterior to the existence of organized beings, is that where traditions of all people represent the earth influenced by the universal deluge, and when, ac-

† Eleméns de Géologie, mis a la portée de tout le Monde, et offrant la concordance des faits historiques avec les faits geologiques. Par L. A. Chaubard. Paris, 1832. 1 vol. 8vo.

cording to Genesis, it was covered during five months. During this second cataclysm, very analogous to the first, as to the exciting cause, and the effects, the transition-formations were produced, and enveloped on all sides the inequalities of the primitive rocks. The third (epoch) is that when the waters of the universal deluge, after having thus covered the earth, abandoned it, not by little and little, nor all at once, but by a peculiar movement, consisting of alternate inversion and retreat; so that in seven months it was left entirely naked and uncovered. During this third cataclysm, following, and immediately dependant upon the second, but altogether different from the first two, as to the exciting cause, and the effects, the alternating series of secondary rocks, properly so called, were formed. The fourth (epoch) is the deluge of Deucalion and Ogyges, a partial deluge, which dates back to the time when the Israelites went forth to establish themselves in Canaan, and which the Greeks, then unlearned, have unfortunately confounded at length, with the universal deluge."* This deluge of Deucalion, M. Chaubard supposes to have happened in the time of Joshua, and to have been occasioned by the standing still of the sun and moon over the valley of Ajalon! that is, the motion of the earth on its axis, was stopped, and this threw the ocean with tremendous violence over the land, rushing from west to east. And although he calculates that it would rush against the western side of the continents, with a velocity about twice that of a canon ball, yet he undertakes to show that the inundation might not have been great enough in Palestine, to render it worthy of notice in history or tradition! How monstrously perverted is the judgment, when it looks through the distorting medium of a favourite hypothesis! And how absurd too, the idea that the same almighty Power that stayed the earth on its axis, omitted to confine the waters to their wonted beds!

One other hypothesis for explaining the manner in

* Eleméns de Géologie, p. 16.

which a universal or extensive deluge might have been produced, without miraculous intervention, remains to be noticed. And we have reserved it to this place, because it seems more in accordance with the state of geological science at the present day than any other; and has been adopted, under a modified form, by some very able living geologists. This hypothesis supposes the bed of the ocean to have been elevated by subterranean heat; or rather, according to some, by vapour and gases resulting from subterranean heat; or according to other writers, by the shrinking of the earth's crust from the refrigeration of its internal parts, whereby that crust is wrinkled or forced into ridges and furrows. In both these ways internal heat is supposed to be the original cause. We find the germ of this theory in the writings of some cosmologists more than a century ago; particularly those of Hooke. And they were drawn out more fully in the latter part of the 18th century by Whitehurst.* Hooke, however, made use of this internal expansive power merely as the agent for forming new continents at the time of the deluge, and destroying the old ones, as we have noticed in the proper place. Whitehurst, also, imagined that this internal force became so powerful as to "burst the terraqueous globe into millions of fragments," and reduced it to a heap of ruins, containing many caverns, into which the water subsequently flowed. Even Mr. Kirby, who adopted this theory of expansion by internal heat,† supposes the action so violent as to account for the confused disposition of marine productions in the postdiluvian earth. But since the crust of the globe has been more accurately studied, it is found that no such confusion of its strata and organic contents exists. Hence those who have recently advanced this theory of accounting for the deluge, suppose either that the bottom of some one of the oceans of the globe, being expanded by the accumulation of vapour and gases beneath it, gradually rose, driving the waters over the land, until by the escape of the gases and perhaps lava,

* Inquiry into the Original Strata of the Earth, 4to. 1786.

† Philosophical Transactions, Vol. 57. p. 44.

the tumefaction became less and less, until the waters were brought back into their previous situation; or they suppose that some one of the most recent mountain ridges of the globe rising from the deep, was the cause of the deluge, without going so far as to decide what became of the waters at the close of that catastrophe. This latter opinion seems to be adopted by Elie de Beaumont, one of the most distinguished geologists of our times, in his recent able essay on the elevation of mountains.* The elevation of a mountain from the bed of the ocean, says he, "would produce effects in countries remote from the spot, similar to the sudden and transient deluge of which we find traces and of a uniform data in the archives of all people." And he adds, "if that historical event be nothing else but the latest of the revolutions on the earth's surface, it will be natural to inquire, what chain of mountains was elevated at the same date; and possibly it will reach the case to remark, that the chain of the Andes, whose breathing volcanoes are yet generally active, forms a ridge the most extended, the most decided, and the least changed from the actual external configuration of the terrestrial globe.

We might here offer reasons for supposing M. de Beaumont mistaken in imputing so recent an origin to the Andes, and for doubting whether the elevation of that chain would have produced effects corresponding so well with known facts respecting diluvial agency, as an upheaving of the surface in some other part of the globe. But this would be premature until we have presented these facts. We will merely make a supposition.

Imagine a volcanic force gradually to lift up a large portion of the bottom of the Arctic ocean. The effect would be to drive the waters southerly so as to deluge perhaps the eastern and western continents. As soon as vents were made through the rising crust, the accumulated vapours within would rush forth, and meeting with the excessive cold of that region, would condense

* Recherches sur quelques—unes des Revolutions de la Surface du Globe. Paris, 1830.

and fall either in the form of snow or rain. After their escape, the ocean's bed might again sink down and the waters gradually return to their place. This supposition is made merely to illustrate that modification of Beaumont's theory which some geologists have adopted. H. de la Beche, a very candid and able living writer, seems to take essentially this view of the origin of the last deluge. And in presenting a paragraph or two from his writings, as well as those of other living and able geologists, our object will be as far as possible to exhibit the present state of opinion on the whole subject of the last deluge.

"In Europe," says De la Beche, "we have at least two accumulations of them (erratic blocks or bowlders), judging from their geological position at comparatively recent periods. One set of erratic blocks has been scattered from the central Alps outwards, on each side of the chain; the other has proceeded from a northward direction southward." After considering the origin of the first set of bowlders, he thus proceeds: "The other great accumulation of erratic blocks seems due to some more general cause, since not only are the blocks scattered in great abundance over northern Europe, in a manner to show their northern origin, but those which occur in the northern parts of America, apparently in in equal abundance, also point to a similar origin. We hence infer that some cause situated in the polar regions has so acted as to produce this dispersion of solid matter over a certain portion of the earth's surface. We know of no agent capable of causing the effect required, but running water." After intimating that the elevation of the bed of the northern ocean occasioned this deluge, he says, "Such waves would necessarily tend to float the northern glaciers with their usual burdens of blocks of rock, lifting them to the southward; but their principal action would be felt where they reached the coasts, and the waves from being little more than great undulations of water became huge breakers,' &c.—"The effect observed would correspond with this hypothesis; for all the blocks have not come from great distances;

they have been detached from various points. Many erratic blocks in England can be traced northward to their parent rock in the British Islands; and the like can be done in the United States."*

But though De la Beche seems, from these extracts, to be of opinion that a deluge of waters has rushed over the northern parts of the globe, yet he makes no attempt to identify this deluge with that of Noah. And, in 1832, he says, that "solutions of the problem of erratic blocks seem not very practicable at present, and our attempts at general explanations can be considered little else than conjectures."† This difficulty of identifying any of the deluges of geology with that of Noah, has led several distinguished geologists of late to give up their former belief, that the phenomena of diluvium did clearly point out the Noachian deluge. But they do not, therefore, maintain that geology furnishes any presumption against the occurrence of such a deluge: rather the contrary. "We now connect," says Prof. Sedgwick, a writer of great ability, "the gravel of the plains with the elevation of the nearest system of mountains," &c.—"That these opinions militate against opinions but a few years since held almost universally among us, cannot be denied. But theories of diluvial gravel, like all other ardent generalizations of an advancing science, must ever be regarded but as shifting hypotheses to be modified by every new fact, till at length they become accordant with all the phenomena of nature. Bearing upon this difficult question, there is, I think, one great negative conclusion now incontestably established—that the vast masses of diluvial gravel scattered almost over the surface of the earth, do not belong to one violent and transitory period."

"We ought to have paused before we first adopted the diluvian theory, and referred all our old superficial gravel to the action of the Mosaic flood," &c. "Are then the facts of our science opposed to the sacred re-

* Researches in Theoretic Geology, pp. 388, 389, 390. London, 1834.

† Geological Manual, p. 177. London, 1832. Second edition.

cords? And do we deny the reality of a historic deluge? I utterly reject such an inference.—In the narration of a great fatal catastrophe, handed down to us not in our sacred books only, but in the traditions of all nations, there is not a word to justify us in looking to any mere physical monuments as the intelligible records of that event: such monuments have never yet been found, and it is not intended perhaps that they ever should be found.—We might, I think, rest content with such a general answer as this. But we may advance one step further.—Though we have not yet found the certain traces of any great diluvian catastrophe, which we can affirm to be within the human period, we have at least shown that the paroxysms of internal energy, accompanied by the elevation of mountain chains, and followed by mighty waves desolating whole regions of the earth, were a part of the mechanism of nature. And what has happened again and again, from the most ancient up to the most modern period of the natural history of the earth, may have happened once during the few thousand years that man has been living on its surface. We have, therefore, taken away all anterior probability from the fact of a recent deluge; and we have prepared the mind, doubting about the truth of things of which it knows not either the origin or the end, for the adoption of this fact, on the weight of historic testimony."*

In 1819, Mr. Greenough maintained, not only that "*a* deluge has swept over every part of the globe, but probably the same deluge."† But, in 1834, he says, "Some fourteen years ago I advanced an opinion, founded altogether upon physical and geological considerations, that the entire earth had, at an unknown period, (as far as that word implies any definite portion of time,) been covered by one general but temporary deluge.—New data have flowed in; and, with the frank-

* Rev. Prof. Sedgwick's Anniversary Address, as President of the London Geological Society, Feb. 18, 1831.

† A Critical Examination of the First Principles of Geology, p. 155. London, 1819.

ness of one of my predecessors, I also read my recantation.—The vast mass of evidence which he (Mr. Lyell) has brought together in illustration of what may be called diurnal geology, convinces me, that if five thousand years ago a deluge had swept over the entire globe, its traces can no longer be distinguished from more modern and local disturbances."*

The opinion of Mr. Murchison corresponds essentially with the two last quoted. "From these and other writings of the present day," he says, "we perceive that correct observations have now established that the diluvial and transported detritus of each great geographical division of Europe, when viewed on a great scale, can, for the most part, be traced to an axis of elevation within that region, so as each great mountain chain has been the source of the detritus covering the adjacent low country, we can no longer attribute such drifts of sedimentary matter to one particular diluvial current which has acted in any given direction."† Again, in an article on the "Gravel and Alluvia of South Wales and Siluria, as distinguished," &c. he says, "he does not think we have yet been furnished with a full explanation of any method by which such blocks (bowlders) have been transported to distances of 100 miles, (that is, from Scotland to Lancashire, Cheshire, and North Shropshire.) Having once ascertained that large distributions of them took place under the sea, the different heights at which we now find them, may, he supposes, be satisfactorily accounted for by movements of elevation and depression, acting upon the bed of the sea with unequal measures of intensity, raising up shells, gravel, and bowlders, which have accumulated at the same period to the respective levels which they now occupy," &c.‡

* Greenough's Anniversary Address before the London Geological Society, February, 1834.

† Murchison's Anniversary Address before the London Geological Society, Feb. 15, 1833.

‡ London and Edinburgh Philosophical Magazine for June 1836, p. 570.

Perhaps the two individuals who have done most to vindicate the opinion, from geological considerations, of a universal flood, in comparatively recent times, are Baron Cuvier and Rev. Dr. Buckland. Says the former—"I am of opinion then with De Luc and Dolomieu, that if there is any circumstance thoroughly established in geology, it is, that the crust of our globe has been subjected to a great and sudden revolution, the epoch of which cannot be dated much further back than five or six thousand years ago; that this revolution had buried all the countries which were before inhabited by men, and by the other animals that are now best known; that the same revolution had laid dry the bed of the last ocean, which now forms all the countries at present inhabited," &c.* The great merit of Baron Cuvier as a zoologist, and especially as a comparative anatomist, has rendered this opinion concerning a deluge almost oracular, although it is well known to geologists that his qualifications to judge respecting difficult points in their science were not of the highest order.

Professor Buckland published a splendid quarto volume in 1823, on the geological evidence of a universal deluge.† Certain curious discoveries which he had made respecting the bones of animals and other matters found in caverns in England and Germany, furnished him with a new and most striking argument in favour of such an occurrence. To this he added the phenomena exhibited by the general shape and position of hills and valleys, by outliers, by deposites of gravel and bowlders, and their organic remains. These arguments were drawn out with great fairness, candour, and ability; and conducted him to the conclusion, that "the discoveries of modern geology, founded on the accurate observation of natural phenomena, prove to a demonstration that there has been an universal inundation of the earth, though they have not yet shown by what

* Essay on the Theory of the Earth, p. 165. New York, 1818. See also Cuvier's Discourse on the Revolutions of the surface of the Globe, p. 179. Philadelphia, 1831.

† Reliquiae Diluvianae, &c. London, 1823.

physical cause it was produced."—"All these facts, whether considered collectively or separately, present such a conformity of proofs, tending to establish the universality of a recent inundation of the earth, as no difficulties or objections that have hitherto arisen are in any way sufficient to overrule."* A second volume of the Reliquiae was long promised by Dr. Buckland, but it never appeared; and it is stated in a late review of his Bridgewater Treatise, that he has abandoned the argument so eloquently drawn out. But as that review does not appear to have been written by one very friendly to Dr. Buckland, we are unable to state precisely what ground he takes at this time respecting a deluge.

The opinion of Rev. Mr. Conybeare, another distinguished English geologist, may be learned from the following extract: "The only two points in which, as it appears to me, the scriptural narration and the phenomena of geology can possibly come into contact, are the recent date supposed to be assigned to the original creation of our globe in the first chapter of Genesis, and the record of the universal deluge; and with regard to the former of these points alone does any *apparent* opposition exist; for, with regard to the latter, the evidences of geology, if not (as some, including Cuvier, have argued) strongly confirmatory, are at least strictly accordant."†

Professor Jameson, the veteran Scotch geologist, speaks of "those last *uprisings* of mountains which have scattered the diluvian gravel."‡

"According to this view," says Professor Daubeny, "the deluge recorded by Moses, as instrumental in destroying the human race, may have been the latest of several floods which have at different times inundated the surface of large portions of the globe, originating from the sudden elevation of some great chain of moun-

* Reliquiae Diluvianae, p. 228.

† London Christian Observer for 1834, p. 308.

‡ Jameson's Edinburgh Philosophical Journal, from Oct. 1832 to April 1833, p. 309.

tains.—If it be asked what is the range of mountains to the elevation of which the deluge in question can be referred? We may reply, that the part of Asia which must be supposed to have been the principal scene of its ravages, is as yet too little explored to allow of our determining the point.—With respect to the universality of the Mosaic deluge, since divines themselves are divided upon it, laymen may surely be allowed a certain latitude of opinion; and it has always appeared to me that the phenomena to which geologists appeal in proof of the reality of the event alluded to, may be just as well explained by a number of partial, though extensive floods, as a single universal one."*

Says Mr. Bakewell, "The most rational explanation that can be offered (of denudation), is that which ascribes the effect to a mighty deluge, sweeping over the surface of the globe, tearing off part of its crust, and transporting the fragments into distant regions, or into the ocean.—None of the causes in present activity (however we may imagine them to be increased in power and magnitude) will be found adequate to produce the denudation of an extensive district, and the disappearance of the stony materials by which it was covered." "Sir James Hall supposes that the upheaving of a large island, like Sumatra, might take place so suddenly as to drive the ocean with great impetuosity over the summits of the highest mountains, and strip off the glaciers, and transport them into distant countries." —"On the whole, the theory of Sir James Hall affords, perhaps, the most satisfactory explanation of diluvian agency that has yet been advanced. But whatever difficulties may oppose the admission of this or any other theory, the fact that the present continents have been subjected to the action of a mighty rush of waters, seems confirmed by many coincident phenomena."†

"Il parroitroit," says Prof. Alexander Brongniart,

* Jameson's Edinburgh Philosophical Journal, from Oct. 1832 to April 1833, p. 206.

† Introduction to Geology, p. 352 et seq. Fourth edition. New Haven, 1833.

so long and well known as one of the best geologists on the continent of Europe, " que la derniere catastrophe generale du globe," &c. " It appears that the last general catastrophe on our globe, that which brought the seas into their present beds, and which has given their form to our continents and the great islands, has produced on the earth's surface phenomena of very different kinds, but which show a common character in their cause and contemporariness. This was the catastrophe that transported erratic blocks; that furrowed out the rocks of the hills and valleys, at a height above existing streams; that covered the elevated plains with pebbles, or piled them into mountains in the lower plains, &c.: it is that which transported, and left in the valleys, bones of the great mammalia, which we find in their sediment, and which filled the caverns and fissures of calcareous mountains, or the osseous breccias, which we find there when the region sustained the animals from whence these bones came," &c. " Did this water come from heaven, or from the interior of the earth? The fissures and cavities opened in its crust, as well the calcareous as granite part, did they not form in part the canals by which the water was poured forth in torrents to the surface of the earth?"*

Another distinguished living French geologist, who has treated fully of diluvial action, is J. J. D'Omalius D'Halloy. He describes the diluvian formation *(terrain diluvien)* as " composed of *debris*, which appears to have been transported by water in situations which existing streams cannot reach; and it has this name, because it seems to owe its origin to a vast inundation, of which Genesis and other historical monuments make mention under the name of deluge, as having ravaged habitable countries with a violence and extent to which there has since been no parallel. Nevertheless, new observations, of which we shall soon speak, lead us to believe that the different deposites which we range under the diluvian formation, are the result, not of one, but of many

* Tableau des Terrains, &c. p. 122. Paris, 1829.

catastrophes. But we shall, nevertheless, continue to regard the name *deluge* as applying to the last of these revolutions; and we shall search for its causes without fearing that we shall mistake effects resulting from previous catastrophes; for every thing shows that these catastrophes were phenomena of the same nature, produced by the same causes."*

This writer thinks that the deluge must have resulted, either "from immense rains, or from an extraordinary eruption of waters from the earth, or by a displacement of the waters of the ocean, either by violent winds, or by the attraction of a celestial body, or by the sinking down of ancient continents, or by the elevation of a part of existing continents."† After an examination of these several causes, D'Halloy prefers the latter; and takes the same views on this subject as Beaumont, already quoted,—viz. that perhaps the deluge was occasioned by the elevation of the Alps. He also inquires as to the actual epoch of the geological, or last deluge, and comes to the conclusion with the De Lucs, the Cuviers, and the Bucklands, that "the revolutions which have given to the mountains their actual forms, and to the rivers the beds which they now occupy, cannot be excessively remote; so that the distance of 4000 years from the present moment, assigned in Genesis as the epoch of the deluge, agrees very well with natural chronometers."‡

In the French *Bulletin des Sciences*, we find an analysis of a Memoir of Hausmann, a distinguished German geologist, on the origin of the bowlders, scattered over the northern parts of Germany, which have long attracted the attention of observers. Hausmann mentions four hypotheses to account for their production. 1. That they are nothing but the wrecks of former mountains, existing in the regions where the bowlders now lie. 2. That they are the products of volcanoes. 3. That

* Elémens de Géologie, par J. J. D'Omalius D'Halloy, 1 vol. Paris, 1831, p. 432.

† Same work, p. 433.

‡ Same work, p. 466.

they have been detached by meteors impigning against the earth. 4. That they were derived from distant mountains. Some say that they came from the south; but most impute to them a northern origin. Hausmann says they have been moved from the north-east to the south-west; and the reviewer adds, "Toutes ces observations etablissent le certitude," &c. "All these observations prove with certainty, that this phenomenon (erratic blocks) is the result of a violent catastrophe, experienced by the globe in the last period of its general changes."*

The same work has the following remarks on the extent of the Noachian deluge: "Le deluge avait pour but de destruire hommes," &c. "The deluge had for its object the destruction of man: it was therefore useless that a general cataclysm should submerge the parts of the earth not then inhabited. Moses describes it as universal for the earth as then known. Certainly he did not embrace America and the Austral regions. This opinion appears more conformable to reason and geological observations," &c.†

From an analysis of a paper by Dr. Beck of Copenhagen, on the geology of Denmark, in a late number of the London and Edinburgh Philosophical Magazine, we infer that he rejects the idea of diluvial action, as necessary to explain the phenomena of transported bowlders. He says, that "space does not permit him to give his views respecting the erratic blocks; and he merely states that their deposition took place after the beginning of the tertiary period, and went on during the accumulation of blue marl and sand, from which he has obtained more than seventy species of shells, now living in the German ocean; and that he has proofs, of which he intends to give a more detailed account hereafter, that the transportation of these blocks continues on the

* Bulletin Universel, &c. 1828, Tome 13, p. 192. Review of Hausmann's paper, entitled, De Origine Saxorum, per Germaniae Septentrionalis Regiones arenosas dispersorum: read to the Royal Society of Göttingen, Aug. 25, 1827.

† Bulletin Universel for 1827, Vol. 10, p. 202.

coast of Jutland."* He imputes their transportation to ice.

We have before us two recent French works on geology, that contain opinions respecting diluvial agency, with which we have not before met. Says M. N. Boubée—"It has often been contested whether there has occurred on the globe a universal deluge, because it could not be conceived of as physically possible without recourse to a miracle. But geology cannot sustain any doubt on the subject. It is very certain that this deluge took place, and devastated all the surface of the globe. It is not proved by the shells discovered on the summit of mountains or in the quarries:—but there are immense deposites of rolled pebbles found in all parts of the world, far from mountains and existing waters, and which could not have been transported but by very powerful waters. Besides, those enormous blocks called erratic, will always furnish an irresistible evidence of a mighty agency, which cannot be imputed to local causes, and which could only be referred to the united action of all the seas."†

"The cause of this deluge is thus described: 'Suppose that a comet should strike the earth in its motion obliquely; what would take place? The violent shock would turn the earth aside or make it return upon itself; its diurnal and annual motions would be stopped or diminished at the time; while at the same time the comet, smaller and more feeble, would be broken in pieces by the violence of the shock, and its debris would be thrown back and dispersed through space."‡ Hence the author supposes the origin of meteoric stones, which he imagines did not begin to fall upon the earth till after the diluvial epoch.

Our readers have doubtless imagined that they have

* London and Edinburgh Philosophical Magazine for June 1836, p. 556. See also an analysis of this paper in Lyell's Address before the London Geological Society, Feb. 19, 1836, p. 13 et seq.

† Géologie Populaire, a la portée de tout le monde, appliqué a l'agriculture et a l'industrie, p. 42. Paris, 1833.

‡ Same work, p. 47.

been reading M. Boubée's opinion respecting the Noachian deluge. But not so: "Geology," he says, "teaches us to distinguish between the deposites of the general deluge and those which were afterwards produced by deluges purely local—among which last we may place the Mosaic deluge." * These local cataclysms he supposes resulted from the elevation of mountains.

Professor Rozet has also published recently an elementary work on geology, the first volume only of which we believe has yet reached this country; and as this is confined rigidly to the statement of facts, we learn but little respecting his views of diluvial action; though he devotes much space to a statement of its effects. It is evident, however, that he places the origin of diluvium long before the existence of man; for he says, "Nous voici arrive," &c. "We have now arrived at geognostic groups (terrains diluvien) of which the producing causes ceased to act previous to the historic times, embracing a population sensibly different from that which now exists on the earth, and among which we discover no trace of man." "The groups which compose the second geognostic epoch, (terrains diluvien) have a great analogy with those of the first *(terrain postdiluvien)*, but what distinguishes them perfectly is, that we perceive at the first glance that the former cannot be the result of causes now in action."† He includes no less than eight principal groups or formations in diluvium: 1. The terrestrial diluvial formation. 2. The marine do. 3. Caverns and breccias with bones. 4. Limestones, marls, &c. with bones of great animals. 5. Pea form iron ore. 6. Peat and fossil forests. 7. Basalt. 8. Trachyte. Many of these groups have been placed by other writers in the tertiary strata; and it is very clear that Rozet does not regard diluvium as the result

* Same work, p. 53. See also Bulletin de la Societie Geologique de France, Tome 4, p. 378. 1834.

† Traite Elementaire de Géologie; par M. Rozet Capitaine au Corps Royal D'Etat Major, Professor de Géologie a l'Athenee Royal, et vice Secretaire de la Societie Geologique de France, p. 255. Premiere Partie. Paris, 1835.

of a single transient deluge, but of the long-continued operation of causes no longer in action previous to the creation of man.

On the other hand, several distinguished geologists have lately risen up and contended strenuously for the principle that the causes of geological change now operating on the globe are the same that have always acted; and further, that their intensity has never varied. These of course deny that any deluges have ever taken place, except such limited inundations as now result from the swelling of rivers, bursting of lakes, earthquakes, and high tides. Mr. Lyell has written a very able work in which he maintains these positions, and which, in the space of a few years, has passed through four editions. "They who have used the terms antediluvian and post-diluvian in the manner above adverted to," says Mr. Lyell, "proceed on the assumption that there are clear and unequivocal marks of a general flood over all parts of the surface of the globe. It had long been a question among the learned, even before the commencement of geological researches, whether the deluge of the Scriptures was universal in reference to the whole surface of the globe, or only so with respect to that portion of it which was then inhabited by man. If the latter interpretation be admissible, it will appear from other parts of this work that there are two classes of phenomena in the configuration of the earth's surface which might enable us to account for such an event. First, extensive lakes elevated above the level of the ocean; secondly, large tracts of dry land depressed below that level."* He here refers to lake Superior, and to an extensive region in western Asia, which Humboldt had stated, on the authority of Professor Parrot, to be sunk below the level of the Atlantic ocean not less than 300 feet. But unfortunately it now appears from the more recent and accurate observations of Professor Parrot, that this is not the case.

* Principles of Geology by Charles Lyell, 4 vols. 4th edition. London, 1835. Vol. 4, p. 214.

"I agree," says Mr. Lyell, "with Dr. Fleming, that in the narrative of Moses there are no terms employed that indicate the impetuous rushing of the waters either as they rose or when they retired upon the restraining of the rain and the passing of a wind over the earth. On the contrary, the olive branch brought back by the dove seems as clear an indication to us that the vegetation was not destroyed, as it was to Noah that the dry land was about to appear."*

"For my own part I have always considered the flood, *when its universality in the strictest sense is insisted upon*, as a supernatural event, far beyond the reach of philosophical inquiry whether as to the causes employed to produce it or the effects most likely to result from it."†

What does Mr. Lyell mean by the phrase which we have italicised in the last paragraph? Certainly not that he believes Noah's flood was universal; for this could hardly be reconciled with the first extract above made, where he seems willing to admit that it might be partial. What can he mean but that he should use such an argument with a man who was a strenuous advocate for the universality of the deluge; while with one who supposed it partial, he would consider it within the "reach of philosophical inquiry as to the causes employed to produce it and the effects most likely to result from it," and refer him, as in the first paragraph quoted above, to the "two classes of phenomena in the configuration of the earth's surface which might enable us to account for such an event." We know nothing of Mr. Lyell's religious creed. But there is something in such an ambiguous mode of treating scriptural subjects that reminds us of infidel cunning and duplicity. We should not notice this language, however, had not the same thing struck us in other parts of Mr. Lyell's Principles of Geology. Thus, in giving the history of geological opinions in the sixteenth century, he says, "it had been the *consistent* belief of the Christian world

* Same work, Vol. 4, p. 216. † Same work, Vol. 4, p. 219.

down to the period now under consideration that the origin of this planet was not more remote than a few thousand years," &c. Does he mean that this belief was *consistent* with the Bible? Then he would array the Scriptures against geology; for the great object of his book is to show that such a belief is inconsistent with philosophy. We are by no means disposed to charge infidelity upon Mr. Lyell; we have, indeed, on a former occasion, attempted to defend him from the charge of irreligious opinions. But we feel bound to say, that we decidedly object to such a mode of alluding to the Scriptures; and Mr. Lyell can hardly expect that it will not excite an apprehension, in those ignorant of his religious belief, that he is sceptical, and that he has been thereby influenced in forming his opinions respecting the deluge and the age of the world.

In his address before the London Geological Society in 1836, Mr. Lyell develops more fully than in his work on geology his theory to account for the origin of bowlders that have been drifted southward in most parts of the northern hemisphere. "We cannot," says he, "be too much on our guard against assuming violent catastrophes where the effects may have been brought about tranquilly, and even with extreme slowness. Let us imagine, for example, a sunken reef of granite, in Baffin's Bay, in about 75° north latitude, divided into fragmentary masses as above described, and these masses becoming year after year involved in packed ice. In a few months they may be drifted more than 1800 miles to the southward, through the straits of Belleisle, to the 48° north latitude, the ice moving perhaps at a slow rate—no more than a mile an hour.—After a repetition of these operations for thousands of years, the uneven bed of the ocean far to the south may be strowed over with drift fragments which have either stranded on shoals or have dropped down from melting bergs. Suppose the floor of the ocean where they alight to be on the rise as gradually as the bottom of the Baltic in our own times.—At length a submarine ridge, covered with the travelled fragments, emerges, and first

constitutes an island, which at length becomes connected with the main land,—in time, perhaps, the site of a university like Upsala. Here the geologist admires the position, number, and bulk of the transported fragments; identifies them with the parent mountains a thousand miles distant to the north; and in speculating on the causes of the phenomena, imagines mighty deluges and tremendous waves raised by the shock of a comet, or the sudden starting up of a chain like the Andes out of the sea, by which huge rocks were scattered over hill and dale as readily as a shingle is cast up by the breakers on a sea-beach." *

The views of Dr. Macculloch, another of the ablest geological writers of modern times, agree with those of Mr. Lyell respecting a universal deluge, though not by any means in the theory of existing causes. "If the deluge," says he, "was produced by other secondary causes than those delivered (in Scripture), we cannot discover them, nor are we required to do so." "Thus imaginary causes of the deluge are properly struck out henceforward from the considerations of geological science." "There is nothing in this history, (the Mosaic) from which we can infer a state of turbulence or violence in the water. There is nothing to make us suppose that the deluge could have disjoined islands, excavated vallies, or deposited alluvia. It is deficient alike in the two needful powers, motion and time." "We have no right to add any thing to what we have received on this head; it is painful to think that they who have most indulged in unwarrantable attempts of this nature, ever deemed censurable in analogous cases, should have been the first to bring forward charges of impiety against those who were content simply to receive that information which the sacred historian thought proper alone to communicate. In this plain narrative, the water rises during a short period and subsides through one not long, leaving on an eminence that

* Anniversary Address, delivered Feb. 19, 1836, p. 32.

vessel which was to preserve and perpetuate man."* "Of the Mosaic deluge in particular, I have no hesitation in saying, that it has never been proved to have produced a single existing appearance of any kind, and that it ought to be struck out of the list of geological causes."†

Dr. Macculloch is very decided in his views of the supreme authority of the Bible over all science. "If there were aught in geology," says he, "which contradicted that Word, I should be among the first to say, the science is in error." ‡

This opinion, that geology furnishes no certain marks of the Noachian deluge, has been advanced by several naturalists a long time ago. Even Linnaeus declared that he saw no evidence of such a catastrophe in nature; which declaration was unreasonably ascribed to his scepticism.

About ten years ago, Rev. Dr. Fleming, a distinguished zoologist of Scotland, engaged with great earnestness in a controversy on the subject, and undertook to show that the views of Baron Cuvier and Dr. Buckland were erroneous. "I confess," says he, "that I entertain the same opinion as Linnaeus on this subject; nor do I feel, though a clergyman, the slightest reason to conceal my sentiments; though they are opposed to the prejudices which a false philosophy has generated in the public mind. I have formed my notions of the Noachican deluge, not from Ovid but from the Bible. There the simple narrative of Moses permits me to believe that the waters rose upon the earth by degrees and returned by degrees, that means were employed by the author of the calamity to preserve pairs of the land animals; that the flood exhibited no violent impetuosity, neither displacing the soil nor the vegetable tribes which it supported, nor rendering the ground unfit for the cultivation of the vine. With this conviction in my

* A System of Geology, with a Theory of the Earth, and an explanation of its Connection with the Sacred Writings, by John Macculloch, F. R. S. 2 vols. London, 1831, Vol. 2, pp. 32, 33.
† Same work, Vol. 1, p. 445. ‡ Same work, Vol. 2, p. 461.

mind, I am not prepared to witness *in nature* any remaining marks of the catastrophe; and I feel my respect for the authority of revelation heightened when I see on the present surface no memorials of the event.—If the geological creeds of Baron Cuvier and Professor Buckland be established as true in science, then must the book of Genesis be blotted out of the records of inspiration."*

Although we here perceive an excitement of feeling very undesirable in philosophical discussion, yet that excitement seems to have aroused Dr. Fleming to a powerful effort; and we confess we have nowhere met with a more able attack upon the evidence of a geological deluge than his paper presents. We have before us, however, an article on the same side of the question, published in 1832 by M. Boué, secretary of the Geological Society of France, and well known as an able geologist. And as it comes from such high authority, and probably contains the strongest arguments that can be presented against the opinion of an universal deluge, we shall be somewhat copious in our extracts. We hope, however, that our readers will not infer that the anti-christian, illiberal spirit which this article exhibits, is a fair specimen of the philosophical productions of continental Europe.

M. Boué's opinion in general is given in the following sentence: "Je suis convaincu," &c. "I am convinced that the vulgar idea of a universal deluge is erroneous, and that there have been many deluges on the earth, among which that of Moses is one of the most considerable, or one of those that have left the most numerous traditional traces."† Yet this author denies that the numerous traditions of diluvial action that have been hand-

* The Geological Deluge as interpreted by Baron Cuvier and Prof. Buckland inconsistent with the testimony of Moses and the phenomena of nature. By Rev. John Fleming. See Edinburgh Philosophical Journal, Vol. 14, (1826), pp. 214, 215.

† Memoires Geologiques et Paleontologiques publies par M. Boué, &c. Tome premier, p. 148. Paris, 1832. This extract and several that follow are taken from his article in that work on Le Deluge, Le Diluvium et L'Epoque Alluviale Ancienne.

ed down to us in all nations have reference to one deluge, and here he quotes the opinion of M. Letronne, whom he calls "an academician of vast erudition," who "instead of a universal deluge admits many local inundations, such as those of Deucalion, of Noah, &c., the tradition of which is preserved among the people near the places where they took place. Afterwards, these catastrophes, embellished by the poets, became unhappily confounded one with the other."

The general conclusions to which M. Boué arrives are these: "1. If many parts of the earth have been subject to inundations, there have not been discovered up to the present time any proofs of a universal deluge, such as is indicated by Moses and adopted by many learned men. 2. The ancient alluvia or diluvium or even parts of these deposites could not have proceeded from the pretended historic deluge. 3. Taking into view the connection between modern and ancient alluvia, and between these last and the more ancient deposites, we learn that existing geological phenomena are only a continuation of those which occurred in former times."

In support of these opinions, he says, that "if the ocean once inundated all the earth, even the highest mountains, we ought to recognize the alluvia thus produced; but the pretended diluvium covers only the great plains, the borders of large streams, and some *plateaux* little elevated." "Masses of rolled stones on high mountains and without the bed of water courses, is a fact that has never been observed," "although elevations (of mountains) appear to have produced in many chains, enormous *debris*, which cover the highest summits in angular fragments." "When the chains (of mountains) were lifted up after the deposition of the tertiary strata, and when the movement was very considerable, an immense quantity of blocks was projected and dispersed by the motion impressed on the waters. All the world knows that this is the origin of the erratic blocks, or a part of those blocks, in northern Europe, in Sweden, as well as in the north part of the United States."

"Much stress is laid upon the organic remains found in diluvium, to prove it the product of a universal deluge. The reasoning might be specious in past ages, considering the state of geology and zoology; but it is astonishing to see similar propositions announced by *savans* so distinguished as many eminent English geologists."

"Finally, the extinct species of animals buried in the ancient alluvia, demonstrate clearly and simply, by means of zoology, that diluvium is not the product of the Mosaic deluge." If these lost species entered the ark, he thinks it would be requisite to resort to a miracle in order 'to metamorphose almost entirely the menagerie of the patriarch Noah.'"

"After having thus debated the question of the deluge, and of diluvium, we might believe that no enlightened man would venture to maintain such reveries. Nevertheless, such are the singular notions that have not ceased to be propagated by well organized heads, in England as well as in France." Yet M. Boué represents nearly all intelligent men in Europe, as having abandoned the idea of a universal deluge. "The idea of a universal Mosaic or historic deluge," says he, "cannot be sustained; such is the opinion of the larger part of the geologists of the continent, and the proofs of its absurdity are so evident that the Lutheran clergy have long since abandoned it, and lately the English clergy, the most tenacious of all, have yielded up their arms." "As to Germany, a long time ago, its clergy of the three communions have wisely abandoned these idle questions."

In the early part of his article, M. Boué protests against being considered sceptical. "I believe I ought in the beginning to wash away from myself the reproach of being a sceptic. I shall be vexed to be thought stupid enough to deny that an inundation, or catastrophe, has taken place in the world; or rather in the region inhabited by the antediluvians. To me this seems to be as really a fact in history, as the reign of Cæsar at Rome." Shall we hence infer that he believes in the divine authority of the Bible? A few extracts further

will decide this question, and enable the reader to judge how much he is influenced in his opinions respecting the deluge, by his views of the Bible generally.

"We desire that morality and religious precepts may be respected as the basis of society; but we are yet far from having extirpated all the superstitions, and all the false ideas, to which the ignorance of so many theologians of the physical and natural sciences has attached a ridiculous importance, &c. The more the clergy are instructed, the more will religion be purified, and serve for the benefit, as it has too often been the injury, of man."

"Would we make the Mosaic traditions correspond with the truths of geology, there are but two logical modes of doing it. We must take every thing in the Bible according to the strict letter, or see in it nothing but eastern allegories; for to take a middle course is to fall into absurdity, since we have no rule to follow. If we should interpret allegorically, we enter a vast field of hypothesis, which can only seduce lively imaginations; and if we adhere to the letter, we arrive insensibly at absurd consequences, and even at manifest contradictions to the Mosaic writings."

"Is it not possible that Moses, being initiated into the science of the Egyptians, and surrounded by deposites of shells, may have wished to represent allegorically that the sea formerly sojourned on all the earth, or at least on the greater part of it?" "Can we rationally decide at what epoch man began to tread the terrestrial soil?"

"It was very natural that theologians, desirous of finding in nature facts similar to those mentioned in their sacred books, should apply themselves to the study of geology; but only a very small number have had any success. Most of them have reasoned in a strange and nonsensical manner; and scarcely none of them have perceived the great difference between scientific conclusions drawn from the observation of nature, and those deduced from the writings of prophets or legislators, who were sent to one people or many people, and were not acquainted with but a small portion of the earth."

M. Boué often couples his hostility to revealed religion with a no less violent prejudice against the English. And here we shall quote a paragraph from one of his more recent productions, viz. his report to the Geological Society of France, in 1834, of the progress of that science during the preceding year:—"Certain English theologians persist ridiculously, in their insanity, to desire to make the results of geology agree with Genesis. England is so overrun with the spirit of sect, that every man is obliged, *nolens volens*, to enlist under some religious banner; so that in the midst of prodigies of industry and advanced civilization, minds even the most elevated, there too often stagnate in theological disputes, which only bring back the dark ages, and of which continental Europe presents no longer but rare examples, thanks to the intelligence of the people and the governments. Nevertheless, we will not dissimilate: if the English rejoice to see their more perfect civilization introduced into Europe, a great number hope at the same time to impose upon us insensibly their thousand-and-one sorts of faith, of different degrees of absurdity, and all for the sure salvation of our souls."*

Is it not disgraceful that a learned scientific society, in the centre of Europe, in the year 1834, should suffer such billingsgate as this to appear in their official Bulletin, and over the name of their foreign secretary! Truly such a paragraph as this, if any thing can do it, shows the need of efforts to introduce among them that faith which they thus ridicule: if not to save their souls, yet to teach them that true liberty of soul, which leads *to do unto others as we would they should do unto us.* We never see such ebullitions of narrow-minded bigotry and intolerance, without being reminded of the sentiment originally applied to an English statesman:

> He narrow'd his mind,
> And to party gave up what was meant for mankind.

But we would by no means intimate, that all those

* Bulletin de la Societie Geologique de France, Tome 3. 1834, p. 166.

geologists whose views respecting the deluge coincide with those of M. Boué, agree with him in hostility to the Bible, and to those who would extend its blessings; for we have every reason to believe that the greater part of them are sincere friends of revelation. Indeed, most of them would be ranked by M. Boué among *méthodistes Anglais.* Yet the extracts we have made, show how greedily any opinions will be adopted by sceptics, which can in any way be tortured to the disadvantage of Christianity. And we have made these extracts, partly with a view to show how disposed the infidel geologist is, whenever he can, to bring geology into collision with the Bible; and hence to show the importance of fairly meeting every apparent difficulty.

Among American geologists, there is the same variety of opinion respecting the geological and historical deluges as in Europe. It is well known that Dr. Cooper of South Carolina, whose geological attainments are certainly very high, coincides in opinion respecting the deluge, as we might predict from a knowledge of his religious opinions, with Lyell, Boué, and others, quoted above. In general, however, our geologists seem to have adopted the diluvial theory, more or less definitively, at least, so far as to believe that a deluge has sometime or other swept over this continent. Says Professor Silliman, "If the universal deluge, recorded in Genesis, be taken as the type of diluvial action, and the time, and the elevation stated in the history, be taken into the account, nothing could be more violent, destructive, overwhelming; and certainly upon the face of the earth are every where recorded, in legible characters, the necessary physical effects of such a deluge."* Says Professor Henry D. Rogers, in describing the country around the falls of Niagara, "The whole of this region has been grooved and scarified by the same far sweeping currents which denuded the entire surface of North America, and strowed its plains and mountains

* Bakewell's Introduction to Geology. Edited by Professor Silliman, p. 413. New Haven, 1833.

with bowlders, gravel, and soil, from the north."* Says Professor William B. Rogers, in describing a certain red soil spread over large districts in Virginia, "In all these cases we must look for the source of the red soil in the extensive region of the West, where nearly all the rocks give rise to it by decomposition; and we must regard it as having been transported to the spot on which it now rests, by some of those sweeping diluvial currents whose action is otherwise attested by evidences of a conclusive character."† A writer in the American Quarterly Review, himself we believe an American only by naturalization, remarks, "To these evidences of a general aqueous catastrophe, when we add the traditionary notions of a like event, found with more or less distinctness amongst unlettered and uncultivated nations at great distances from each other; and above all, when we find a great diluvial catastrophe in the most ancient of all records—a record held sacred by all Christian nations; we appear to possess every sort of physical evidence of the surface of our planet having submitted at some period or other to the mastery of the waters." "America, as we think, would present phenomena entirely inexplicable by ultra fluvialitism."‡ "This fact," says Dr. C. T. Jackson, "I consider of value in geology, as it concurs with so many others, to prove, that at some period since the creation there has been a powerful current of water rushing over our continent from the north-west toward the south-east; a current of such mighty power as to carry away with it enormous quantities of large, rounded bowlders, and deposite them many miles from their original localities. It is highly probable that this was effected by that last grand cataclysm which overwhelmed the world, and to which the traditions and religious belief of every nation give ample testimony."§

* American Journal of Science, Vol. 37, p. 239. New Haven, 1835.

† Report of the Geological Reconnoissance of the State of Virginia, p. 28, Jan. 1836.

‡ American Quarterly Review for 1830, pp. 373, 374.

§ Boston Journal of Natural History, No. 1. p. 55. Boston, 1834.

We might multiply quotations of this sort, but it is unnecessary. We have now given a full view of the progress, and especially of the present state of opinion among geologists respecting the deluges of history and geology. We have seen, that beginning with the belief that every important geological change on the globe since the creation ought to be imputed to the deluge of Noah, nay that the globe itself was torn to pieces and dissolved by that event, learned men have gradually so modified their opinions on the subject, and their ideas of diluvial agency have been so diminished, that the question now is whether there are any traces on the globe of the Mosaic deluge; nay, whether there is any proof of a general deluge at any period. Formerly all the disturbances and organic remains deep in the earth were regarded as conclusive proof of such an event; but geologists have long since abandoned every supposed proof below the surface; and now some of them begin to deny that even there is any evidence of diluvial agency. Amid such fluctuations of opinion, even among those best qualified to judge, it is no easy matter to present its exact condition at the present time. Yet in order to compare these opinions with the Mosaic account, we must know what they are: and therefore we have made numerous extracts from the most modern and able geological writers, and endeavoured also to point out those instances in which we believe the witnesses to be incompetent to give an opinion, either from their want of thorough knowledge of the subject, or from violent prejudices. Even setting aside such authors, we expect that our readers will regard the existing state of opinion respecting diluvial action as not a little chaotic. We think, however, the opinions of able geologists of the present day respecting diluvial action may be reduced to three classes:

The first class deny that any universal or even general deluge has occurred on our globe, and suppose that the deluge of Noah was local like that of Deucalion, Ogyges, and others.

The second class admit a general deluge; but sup-

pose it took place before the creation of man, and make the Mosaic deluge a local event.

The third class suppose that the traces of several extensive, if not universal deluges, are to be found on the globe, and that the last of these events may have been identical with that of Noah.

We are now prepared to bring these opinions into direct comparison with the Mosaic history. But this we must defer till another opportunity; for we doubt not that our readers as well as ourselves will by this time be gratified with a hiatus.

THE

HISTORICAL

AND

GEOLOGICAL DELUGES

COMPARED.

PART II.

BY

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MDCCCXXXVIII.

JAMES BURNET, Printer, 23 Thistle Street.

THE

HISTORICAL AND GEOLOGICAL DELUGES COMPARED.

PART II.

In a previous number* we came to the conclusion that the opinions of standard geological writers of the present day on the subject of deluges, are reducible to three classes.

Those of the first class, deny that any traces of a general deluge remain on the globe.

The second admit that a general deluge has happened, but place the date of its occurrence previous to the existence of man.

The third maintain that there are distinct marks of a general deluge which may have been identical with that of Noah.

In proceeding now to make a direct comparison between these opinions and the facts both of geology and revelation, we may group the first two classes together; since they agree in maintaining that no traces exist in nature of the Noachian deluge. Let us now see whether such an opinion brings its advocates into collision with revelation.

In the first place, we maintain that it is unreason-

* The Article referred to forms No. XXIX. of the Students' Cabinet Library of Useful Tracts. *Erratum* in No. XXIX. page 26, (paging at bottom, 256) *for* Bishop Burnet *read* Dr. Thomas Burnet.

able to expect any traces of the Mosaic deluge in the secondary or tertiary rocks.

Were we addressing geologists alone, an attempt to prove this position would be superfluous; since they all assent to its truth. But we have seen that many very respectable writers still appeal to marine petrifactions in the solid rocks, that is, in the secondary and tertiary formations, as proof of the occurrence of Noah's deluge. Indeed, this is the prevailing opinion among the religious reading part of the community. This is quite an advance upon the dogma of physico-theology which broke up and even dissolved the entire crust of the globe by the last deluge; yet in fact the two opinions are almost equally opposed to the principles of geology; still it is not an easy matter to make their absurdity manifest to such as have not a familiar acquaintance with the science. We will, however, present the argument in as popular a form as possible.

It may be necessary here to premise, that in the secondary and tertiary rocks, we include all the stratified rocks containing organic remains, except those in the loose sand and gravel scattered over the earth's surface, and called diluvium, and those in the deposits that are daily taking place, and which are called alluvium. In other words, we include nearly all the solid rocks in which there are petrifactions. And in these we maintain, contrary to the prevalent opinion, that it is unreasonable to expect to find any marks of the Mosaic deluge.

In the first place, the action of such a deluge must have been for the most part violent and tumultuous, tearing up the surface in some places, and sweeping the detritus into others; whereas a large proportion of the fossiliferous rocks appear to have been deposited in quiet waters.

Moses represents the deluge to have been produced by a rain of forty days and the breaking up of the fountains of the great deep. Those rains, that often in the present state of the globe produce wide-spread havoc, rarely continue more than a week; yet they enable us

to form some idea of a storm continued more than five times as long; and the impression left on the mind by this comparison is one of violence and desolation. The breaking up of the fountains of the great deep, has always been understood to mean the pouring forth of water from subterranean reservoirs beneath the ocean; though it may mean simply that the sea rose over the land. * But in either exegesis, the action of the rain must have been rendered more rather than less tumultuous by the inundation of the ocean. And when the waters began to subside, Moses represents a wind as passing over the earth to urge them from the land. So that both in their rise and fall they must have passed over the surface in currents, more or less powerful according to local circumstances. How, in view of such facts, writers as distinguished as Linnæus and Dr. Macculloch, can assert that "there is nothing in this history (of the deluge in Scripture) from which we can infer a state of turbulence or violence in the water, we are unable to see. Nor are we able to reconcile with such an opinion the fact that the ark was almost hermetically sealed, having in it but a single window; so shut up, indeed, that until its covering was removed, Noah could not distinctly see, from his lofty station, whether the earth was dry or not. Was it not thus closed because it was exposed to the violence of tumultuous waters?

Admitting now this turbulence, how could so large a proportion of the fossiliferous rocks have been formed of the finest materials, and have contained so many organic remains with their most delicate parts uninjured? These deposits, if made by such a deluge, ought rather

* Prof. Stuart, by a faculty for which he is so justly distinguished of giving the meaning of the Scriptures definitely and accurately, has very happily expressed the literal meaning under consideration. Says he, "the fountains of the תְּהוֹם, *the great deep, the ocean*, were opened (נִבְקְעוּ), as well as the 'windows of heaven;' i. e. the ocean overflowed, while the rain descended in vast quantities." *Hebrew Chrestomathy, p.* 150.

to be composed of those coarse fragments which are now swept along by floods, with broken fragments of animals and plants intermingled.

In the second place, the materials and entombed organic relics of rocks, formed by such a deluge, ought to be found confusedly mingled together; whereas the several groups of the fossiliferous rocks are actually arranged with great regularity. They are as regularly arranged, indeed, as the leaves of a book. Each successive group contains organic remains almost as distinct from one another as the contents of successive pages in a book. In a book, the paper and the form of the type remain essentially the same; but are differently grouped, so as to make out very different senses on different pages. So in the rocks; while their general characters, mineralogical as well as palaeontological, remain similar in different strata, they are so modified in the successive layers as to reveal a very different history of the various periods in which they were formed. Had they been produced by the deluge of Noah, their mineral and organic contents must have been blended promiscuously together, just as we find them in that confused mixture of sand, gravel, and organic relics, spread over the surface of all countries hitherto explored, and which is denominated diluvium.

In the third place, the duration of Noah's deluge was too short to have allowed of the production of such immense numbers of perfect petrifactions as the fossiliferous rocks contain; and too short for the numerous distinct changes in the materials and organic contents of those rocks, which must have taken place during their deposition.

The process of petrifaction, or the conversion of a substance into stone, whenever it has been observed, is a slow one. In those cases, indeed, where an organic substance is immersed in a solution of some compound of iron, as for instance, in copperas, it does not require many years to produce a considerable degree of mineralization. In this case, however, the pores of the substance are merely filled with mineral matter, but the

harder parts of the animal or vegetable remain; and we know of no facts that show how long it will require to effect a complete substitution of mineral for organic particles. To imagine, however, that the whole period occupied by the Noachian deluge, supposing it to have been a year, was sufficient to have produced a single petrifaction, according to the laws that now operate in nature, is contrary to experience. But the fossiliferous rocks are of immense thickness; so that if those that have been described in Europe were to be laid one upon another in a particular spot, they would form a pile eight or ten miles in height. And the successive strata contain petrifactions of thousands of animals and plants, which must have been successively buried and converted into stone. In many of the layers, indeed, especially the uppermost, the process is only partial; though in all the formation, we find some instances of perfect petrifactions; and through two-thirds of the thickness, reckoning upwards, the exceptions to a perfect change are very rare. No reasonable man can believe that such a vast work could have been accomplished by the diluvial waters, unless he suppose the petrifying power of the waters to have been at that time vastly more active than at present. But of this there is no proof; and since there are so many proofs of the constancy of nature's operations at all times, we are not at liberty, without strong necessity, to sustain a favourite theory by imagining an indefinite potency in the operation of causes in early times. True, geologists have thought themselves obliged to admit the greater energy of some natural processes in former periods, than at the present moment. And why? Because they think they see proofs of more powerful former action. Let similar proof be produced in the case of petrifactions, and they will admit a greater rapidity of the process of petrifaction in former periods; though the chemist would probably doubt whether this is a process that could be greatly accelerated by any conceivable circumstances. We admit, indeed, that a miraculous agency might have petrified all organic life on the globe in a moment.

But the moment we call in the aid of miracles to account for the phenomena of petrifactions, or any other effect, we of course exclude all natural operation and therefore all philosophical reasoning. We are willing to admit a miracle where a miracle can be proved, even in nature; but we contend that when we have admitted any event to be miraculous, we must cease to attempt to explain it philosophically. For who will undertake to give us the dynamics of a miracle?

But the slowness of the petrifactive process is one of the minor difficulties opposed to the diluvial origin of fossil organic remains. The rocks which contain them are divided into several distinct groups, and these into hundreds of minor strata, quite, and sometimes totally distinct from one another in their mineral and organic contents. Is it possible now, to conceive how the diluvial waters should have been successively charged with ingredients so widely and often totally distinct; so that now they should deposit only limestone, now limestone with clay, and then with sand; now clay alone, and now sand only; now the coarsest pebbles, and now the finest loam; now gypsum, then chalk; then rock salt. But the changes in the organic remains in different groups of strata are still more difficult to explain by diluvial action. For some of the larger groups, the secondary and tertiary series for instance, do not contain any animals or plants that are common. And in the lesser divisions of the strata we find many new genera and species that appear for the first time as we ascend in the series, and then often again disappear from the next higher member. In a particular formation, however, there is a general correspondence among all the organic beings found in it; as if all were adapted to a particular set of circumstances; while in the next formation, either above or below, the type of organic existence is changed, as if adapted to a new set of circumstances. If we find one animal, or plant, for instance, adapted to a tropical climate, we find all others in the same formation fitted to a similar condition. If one animal appears intended for living in a low marshy re-

gion, we find others, as well as the plants, analogous to those that now flourish best in such situations. If we find one marine animal in a rock, nearly all the other organic beings in the same rock are of marine origin: though in such a case, there is an occasional mixture of fresh water or terrestrial remains, which appear to have been drifted into the ocean by floods and rivers. On the other hand, if we meet with a few fresh water remains in a rock, we may calculate that nearly all in that stratum partake of the same character. In short, the evidence is perfectly irresistible, that the successive groups of organized beings in the different formations must have lived and died in different conditions of the globe, which are incompatible with one another so far as animal and vegetable life are concerned. How can all this mutual adaptation of organic beings, the regularity of their groupings, the total diversity in some cases of their specific and even generic characters, and the evident adaptation of their natures to diverse and changing circumstances,—how is all this to be explained, if organic remains be the result of a deluge of a single year! Really, it seems to us that it is hardly possible for the human mind to conceive of an explanation of the origin of organic remains more absurd and opposed to facts.

In the fourth place, the organic remains in rocks do not correspond with the animals and plants now existing on the globe. In the higher members of the tertiary strata, we find a few species which cannot be distinguished from those now alive. Yet the greater part of the species, even in the tertiary rocks, are extinct: and if we descend into the secondary class, out of the thousands of species that have been brought to light, it is said that not one appears to be identical with any now in existence. But if they were all buried by the Noachian deluge, how happened our existing races of animals and plants to have escaped? And how happens it that the deeper we deseend into the earth, the organic remains become more and more unlike living beings? If entombed by the agitated waters of a deluge, we

ought to expect that our existing races would be found as often at the bottom as at the top of the fossiliferous rocks. There is no way of avoiding these conclusions, except by maintaining that there was an entirely new creation at the deluge; and of species for the most part different from those that were destroyed by that catastrophe. We have, indeed, no serious objection to the supposition that a new exertion of creative power was put forth subsequent to the deluge: but we suspect if it did take place, the new animals and plants created must have been of species that existed previously: for it seems to have been the express object of taking pairs of all animals into the ark, to continue in existence those species that were living before the flood. And we know that man was the same before as after the deluge. Yet no remains of antediluvian men have been discovered in the rocks. Nor can this difficulty be got over by saying that man may not have existed in Europe and America before the deluge: for organic remains have been obtained from many places in Asia, and have been found to agree with those of Europe and America in a want of conformity to the existing organic creation, and the absence of human relics.

But we will not any further multiply arguments, although it might be easily done, to show that no marks of the Noachian deluge are to be expected in the secondary and tertiary rocks. For if any of our readers, in spite of the opposing evidence now presented, will still believe that the petrifactions abounding in these rocks are to be referred to that catastrophe, probably no further array of arguments would change their opinion. We can hardly believe, however, that any intelligent man, who will look at the subject even as we have presented it, until he understands it, will much longer hold on to a belief, which ought no more to stain the fair escutcheon of our theological literature.

2. We proceed to say, secondly, that the Mosaic account does not require us to admit that any traces of the Noachian deluge would remain permanently on the face of nature. Even admitting, as we have done, that

the scriptural account would lead us to infer that not a little of violence and tumultuous action attended that event, it does not follow that its effects could be distinguished thousands of years afterwards. Currents of water could have affected only the surface of the globe, and their effects would be similar to those now produced by rivers and floods. Yet as they would be spread over the whole surface, and not so much confined as rivers to a particular channel, they would be less striking and sooner obliterated. They would consist principally in the removal of the softer parts of the surface and the abrasion of the harder parts. But similar processes have been going on ever since the last deluge, almost every where; and whether, after the lapse of centuries, we should be able to distinguish diluvial from alluvial action, it is impossible to say. Perhaps the traces of Noah's deluge might be all obliterated. If they are all gone, then, the fact argues nothing against the scriptural account.

Those geologists who deny that there are any marks of a general deluge on the globe, for the most part maintain, that the Mosaic account of Noah's deluge does not imply any violence or powerful movement in the waters. In a former number of this work we have quoted the opinion of several of these writers; and it is unnecessary to repeat them in this place. We have made the supposition most unfavourable to the Scriptures, viz. that there was violence and tumult in the diluvial waters; and therefore some traces of them must for a time have remained. But we think that no man capable of estimating the effects of geological agencies will maintain that they must certainly have remained till the present time.

3. But thirdly, even if no real traces now exist, we maintain that geology furnishes presumptive evidence in favour of the occurrence of such a deluge as that of Noah.

In the opinion of most geologists, this science teaches us that there have been numerous deluges, more or less extensive, that have swept the earth's surface since the

commencement of the changes which its crust has undergone: And if causes have existed sufficiently powerful to produce these catastrophes in times past, why might not that of Noah have been one of the number? That different chains of mountains have been upheaved at various epochs from the bottom of the ocean, seems to be extremely probable. And if this was done suddenly, it must have thrown the ocean in violent commotion over lands already elevated. The last occurrence of this kind may have constituted the deluge of Noah. It is true, that a few able geologists, who will admit no diminution of energy in the forces that have acted on the globe, reject the opinion that mountain chains have been suddenly elevated; and these writers will allow of the occurrence of only limited deluges, such as do now sometimes happen. On their theory, geology furnishes no presumption one way or the other in respect to Noah's deluge; and they suppose that event to have been miraculous. But in the view of the greatest number of geologists, the evidence of former powerful deluges is too strong to be resisted. That evidence, in respect to the last of these events, we shall now proceed to exhibit, in a form as much divested of technicalities as possible, that our readers may be able to judge for themselves, which opinion on the subject is most probable. We have shown, that even on the supposition that geology is utterly destitute of proof respecting the Noachian deluge, or even of any general deluge, it does not bring science at all into collision with the Scriptures. But should we be able to make out a probable argument in favour of a general deluge in former and comparatively recent times, even though we cannot fix its date, it will afford a presumption in favour of the Noachian deluge.

Our object is to present the evidence, which has been relied on in geology, to prove a general deluge. And we wish for the present to leave out of the argument all reference to Noah's deluge; and simply to inquire, whether there is geological evidence of an extensive deluge since the earth assumed essentially its present form.

We have already attempted to show that it is unreasonable to look for any such evidence in the regular strata of the globe. We must, therefore, confine our attention solely to the surface. And the position taken by those geologists, who maintain that here we do meet with marks of a deluge, may be stated as follows.

The phenomena of diluvium prove a powerful rush of water from the north over the northern hemisphere.

To make this argument understood, we must go somewhat into detail. And we shall, as far as possible, confine ourselves to the diluvium spread over the northern part of the United States: both because we have very extensively examined it with our own eyes, and because we apprehend that there are one or two important parts of the evidence, obvious enough in our country, which seem to be much less perfectly developed in Europe.

1. The first fact that sustains the above position, is, that *bowlders and diluvial gravel are found almost uniformly in a southerly direction from the rocks from which they have been detached.*

For such readers as are not much acquainted with the details of geology, a few explanations may here be necessary to the full understanding of this subject.

There are scarcely any individuals who have not observed, that the greater part of the earth's surface is covered over with sand and gravel, rounded by water; although it may often be hid by the alluvial soil that from year to year is accumulating. Sometimes too, ledges of rock break through this deposit. In other places it is piled up into small hills, having that rounded outline, which results from the action of water. Indeed, no one can attentively examine these accumulations of sand and gravel, without being satisfied that they are composed of fragments broken off from ledges of rocks and rounded and triturated by currents of water, and by those currents removed away from their parent rock, and brought into their present situation. Such masses of sand and gravel are denominated *diluvium*, under an impression that they must have resulted

from a partial or general deluge. For all accumulations which could have been brought into their present situation by existing streams, or any other agencies now operating, are not regarded as diluvium; and it is only those deposits whose present situation cannot be explained by existing agencies, that are thus denominated. Now the position which we take is, that this diluvial sand and gravel, will, on examination, be found to have been swept in a southerly direction from the bed of rocks whence it was originally derived.

Among this diluvium will often be found masses of rock larger than pebbles, often, indeed, several feet in diameter, which are more or less rounded, and often lie for the most part above the surface. These are called bowlders, or erratic blocks. The famous rock, Horeb, is a large block of this description, detached from the precipices of mount Sinai; as is also the well-known Pilgrim Rock at Plymouth, in New England. In that portion of our country, indeed, bowlders meet the eye of the traveller almost everywhere, and are sometimes so numerous as to form a principal feature of the landscape. And even in the prairies and plains of the West, blocks of the same description, evidently strangers to the spots where they lie, are not unfrequent. They may be often seen upon the pinnacles of mountain ridges, and by their peculiarity of mineral composition, may be traced to the rock from which they were broken off, at the distance of many miles, and separated by deep vallies. And these bowlders, as well as the diluvial gravel, are found to be carried in a southerly direction from their native place. We shall now refer to several examples, in the northern part of our country, of such transportation: and if our readers have not in their minds a very accurate and clear knowledge of the geography of that region, they will find it necessary to have reference to a good map.

We may begin with the territory of Nova Scotia: For we have the testimony both of Sir Alexander Croke,* and of our own countrymen Messrs. Jackson

* Buckland's Reliquiae Diluvianae, p. 217. London, 1823.

and Alger,* in their able account of the geology and mineralogy of that country, that in searching for the origin of the numerous bowlders spread over the southern parts of that province, they found the parent ledges to the north of the bowlders.

The same is true of the State of Maine through its whole extent. The first time we passed along the coast from Portsmouth in New Hampshire to Portland, we noticed that the surface frequently showed bowlders of rocks quite different from those in the ledges under our feet. This was especially true in the vicinity of Portland, and although entire strangers to the geology of the surrounding region, yet having so often noticed in other parts of the country the southerly transport of the bowlders, we did not hesitate to predict with confidence, that gneiss would be found in great abundance a few miles from the coast; a prediction which was fully confirmed by subsequent examination. In respect to that part of Maine lying easterly of Portland, we have the testimony of Dr. C. T. Jackson, geologist to the State, that this same principle he found to be invariably true. In a private letter he says, "I discovered everywhere in Maine the fullest confirmation of your opinions respecting the last great cataclysm; and the bowlders always led me directly to their origin as I proceeded north. The current was everywhere indicated to have been from the north-west towards the south-east." The same gentleman, in his recent Report on the geology of Maine, repeats these opinions, and gives several particular cases in which he traced back travelled bowlders to their parent rock, either north or north-west.†

As we pass along the eastern part of Massachusetts, we find a great increase of diluvium and bowlders. The region north of Boston is remarkable for the vast number of the latter, poised upon almost every eminence,

* Memoirs of the American Academy, Vol. I. p. 302. New Series. Cambridge, 1833.

† First Report on the Geology of Maine, pp. 64, 65, 110. Augusta, 1837.

and often of great size, and for the numerous ledges of sienite and trap that appear as if they had been subject to powerful denudation. As we go south of Boston, into the counties of Norfolk, Plymouth, and Barnstable, we meet with such vast quantities of diluvial sand, gravel and bowlders, evidently of such rocks as form the ledges of the northern parts of the State, that we no longer wonder why those ledges appear as if they had suffered such powerful abrasion. We cannot doubt but the counties of Essex and Middlesex, with the southern part of New Hampshire, have had their surface pared off, and that the ruins are now before our eyes, all along the coast from Rhode Island almost to the extremity of Cape Cod, and upon all the islands along that shore.

But lest such a general view should be thought too indefinite, let us select some individual examples, in which we can trace a particular rock along an extended line. Some rocks are so peculiar in their appearance that they never can be mistaken wherever seen; and some of them occupy but a small space where they show their ledges in place. Now if we find the bowlders of such a rock scattered along a particular line leading from the ledge, while they are found in no other direction, and moreover decreasing in size the further we go from the native bed, the conclusion is irresistible, that a current of water has some time or other driven them along that line, and left them at intervals. Now we can point out many such cases. A few miles, both north and south of Boston, for instance, are ranges of porphyry extending east and west only a few miles; from Malden to Lynn on the north, and from Natick to Hingham on the south. If we approach these ranges from the west, and the most northerly one from the north, we shall find no fragments of porphyry in the diluvium: But go from thence in a direction a little south of east, and we shall find these fragments to the shores of the ocean, and upon the Elizabeth Islands and Martha's Vineyard. One variety of this rock is of a blood-red colour, and its ledges are found in Hingham;

but we have seen large fragments in the central parts of Martha's Vineyard, more than sixty miles distant, in a direction a few degrees east of south.

By looking at a geological map of Massachusetts, it will be seen, that along a meridional line, extending from the island of Rhode Island across Massachusetts, are successive and alternating patches of graywacke and sienite, or some other associated unstratified rock. Hardly any rocks are more easy to distinguish than the graywacke and these unstratified ones. Now let a person start from the region of sienite and trap rock, a few miles north-west of Boston, and travel southerly. Until he reaches the northern limits of the graywacke, which lies west of Boston, he will see no bowlders of that rock on the surface; but those of sienite, granite, and greenstone, almost exclusively; and even for several miles after he finds himself passing over ledges of graywacke, the fragments of these rocks will continue as numerous as those of graywacke. The latter, however, will increase, and the others decrease; and even after he has crossed the southern limit of graywacke, and entered upon another region of unstratified rocks, the masses of the former will be very numerous. Those of the latter, however, will gradually increase until they predominate; and will continue most numerous long after he has entered upon another region of graywacke. And thus at each successive alternation of these two rocks, he will find that the fragments of that which lies north of the other, have been swept southerly; so that he must learn the nature of the formation beneath his feet, not by the bowlders, but by the ledges. But in no case will he find the reverse of this process to have taken place.

In Cumberland, the north-eastern township of Rhode Island is a large bed of iron ore, occupying several acres at the surface; and much of it exhibits the peculiarity of being spotted with white crystals of feldspar; so that the man most unacquainted with minerals could at once distinguish this ore, by its great specific gravity and porphyritic appearance. Let one now ap-

proach this bed of ore from the north, or the east, or the west, and he will meet with no fragment of it until close to the spot. But let him pass from the bed in a direction a little south-east; let him go for instance toward Newport in the same State, and he will frequently notice rounded masses of this ore in the stone walls and fields, at first a foot or two feet in diameter, and rather common, but gradually diminishing in size and number, until he reaches the ocean; for even at the southern extremity of Newport, have we picked up large pebbles of this ore, between thirty and forty miles distant from its parent bed. In this very distinct example, we seem not only to be certified of the occurrence of diluvial action, but the precise direction of the current is pointed out.

In the valley of Connecticut river we find very remarkable effects produced by a northerly and powerful current of water, at an elevation several hundred feet above the present bed of the river, whereby bowlders from well known localities are strowed over the surface, and lodged on the tops of the highest hills; and vallies of considerable depth have been scooped out. But it would require maps even to make the facts intelligible; and as a question might be raised, whether all this did not result from the river itself, when its bed was much more elevated than at present, and as the discussion of this point would require more time and space than we have at command, we shall give to the remarkable effects of former aqueous agency in this valley, only this passing notice.

In ascending the broad and elevated range of mountains between Connecticut and Hudson rivers, we do not get too high for the marks of diluvial action. Several limited beds of serpentine, for instance, occur in the loftiest parts of that range. This is a rock so peculiar that it is not easily mistaken. Now the same things are true in relation to the bowlders derived from these beds, as have been stated in relation to the iron ore of Cumberland. They abound in a southerly direction from the bed, but are not found in any other;

unless it be in the beds of streams that run easterly or westerly.

On the highest part of the Hoosac range of mountains, of which we are now speaking, it being the southerly continuation of the Green Mountains of Vermont, we find, by tracing bowlders to their native beds, that the diluvial current moved in a nearly south-east direction; and this appears to have been its course as we proceed towards Hudson river; and indeed through most of the western and southern parts of our country, so far as it has been carefully ascertained. In the eastern part of New England, it appears rarely to have run more than 15° or 20° east of south. Whether the deflection above spoken of, be the result of local causes, or of different and successive waves, during the same general deluge, or even of successive deluges, we have not room nor time fully to discuss in this place. It is easy to conceive how local causes might have given to one part of a current, hundreds of miles wide, a direction some 20° or 30° different from another part. And perhaps it is still easier to imagine, that successive waves, proceeding perhaps from new centres of disturbance, might thus differ in their course. If two deluges be supposed, they must have probably been nearly contemporaneous; since the diluvium is so mixed together that it is impossible to say which was earliest produced. Nor do the diluvial grooves, to be described shortly, differ in distinctness, whatever be their direction; so that they cannot differ much in age.

The predominant direction of the vallies in New England is north and south; and in the western part of Massachusetts they are quite deep, while the mountains that form them, rise rather abruptly from 1000 to 2000 feet. Hence the diluvial current must have crossed these ridges and vallies obliquely. But nevertheless, its waters seem to have had power to force an immense quantity of diluvium and bowlders to the very top of the Hoosac and Taconnic mountains. At the western base of the former mountain, is an extensive formation of granular quartz, running north and south, whose frag-

ments are among the most indestructible of rocks. And as we proceed south-easterly from the beds of this rock, and ascend the western slope of Hoosac mountain, the rounded fragments of this rock meet the eye almost constantly, decreasing, however, in size and number as we ascend; yet even on the top of the mountain they are not uncommon: Nay, they abound over the whole eastern slope of the mountain, and small ones may be found mingled with other detritus through the whole southern part of the valley of the Connecticut. We have met with them frequently in the vicinity of New Haven; which must be at least fifty miles from the nearest bed of quartz rock in a north-west direction. Whether any other cause than a diluvial current could have removed these masses so far, we shall inquire further on: But if such be their origin, they furnish an impressive example of the great power exerted by this aqueous agency. When we see even large masses of rock transported by water on a plane nearly horizontal, we are not surprised; especially when we recollect that a rock is only about half as heavy in water as in air: But when we see these masses urged up the sides of mountains of considerable steepness, we cannot but feel that the power requisite to perform the work must have been more energetic than any we now witness from aqueous agency. Yet several other circumstances, some of which we have still to mention, show us that this rush of waters must have possessed prodigious power, far superior to any similar agency in modern times; so that a survey of all the phenomena will prepare us to admit particular effects as resulting from this *debacle*, which we could not admit judging from the standard of present agency.

We will here refer to one other phenomenon of diluvium, that has always struck us as indicating great power and violence in the diluvial waters. Those who have ever examined the surface over which strong and eddying currents of water have passed, have noticed that the sand presented an uneven surface, composed of irregular elevations and depressions; the former having been scooped out to form the latter. Precisely similar eleva-

tions and depressions are seen in diluvium: Yet the elevations are so high, and the depressions so deep, that few men think of referring them to the agency of running water. But by comparison with the comparatively puny effects of water in the forms in which we now witness them, it will be clearly seen that both belong to the same class of phenomena; and that the causes differ only in intensity. While the elevations which we now witness, as the result of land floods, rarely exceed a few inches in height, those existing in diluvium are often ten, twenty, thirty, fifty, and sometimes even one hundred feet high. Among innumerable examples that might be quoted, let us refer to one or two only. The most ancient grave-yard in New England, that in Plymouth, where many of the earliest pilgrim fathers sleep, appears to be one of these diluvial hills; and as we stand upon it, and look abroad, we see many others of irregular rounded outline, with intervening depressions, the result evidently of powerful aqueous agency. Or if we go near the extremity of Cape Cod, where sand constitutes almost the entire soil, and where consequently a violent rush of waters would be likely to produce effects still more striking than in harder soil, there these elevations and depressions are of gigantic size. Yet it is not necessary to visit these spots to see enough of such appearances to be deeply impressed with the prodigious energy exerted by the last current of water that has swept over this continent. For the observing man may find them on a scale of considerable magnitude in almost every town.

But we have more examples to state of the southerly drift of diluvium in our country. In digging into the clayey soil around the city of Hudson, N. Y., the clay was found to have been disturbed eighty feet in depth by aqueous agency; and among the rolled pebbles were numerous examples of a peculiar black limestone which is developed near Lake George, about sixty miles north, especially at Glenn's Falls.* For aught we know, however, this same rock may extend westerly a considerable

* American Journal of Science, Vol. VI. p. 33.

distance from the lake; but if it does, this will give us either a north or north-west direction for the native spot of these limestone masses. Still, as it may be contended by the fluvialist that these fragments of rocks have been drifted southerly by Hudson river, though we suppose the error of such a statement might be shown, we choose to refer to other examples that admit of no such explanation.

The vallies of Berkshire county, Mass., lie between the Hoosac and Taconnic ranges of mountains, which run north and south. Those vallies are occupied mostly by white limestone, while the Taconnic is composed of argillaceous, talcose, and micaceous slate. But at a little distance west of this mountain, commence extensive strata of greywacke and dark coloured limestone. Now bowlders of these latter rocks are found scattered everywhere through the vallies of Berkshire, and some of them occur even on the top of the Hoosac range. These must certainly have been carried over the Taconnic range, which in every place is several hundred feet higher than the greywacke and limestone beds. Effects like these, which must have required more than Sisyphean labour, and examples of which are common in New England, have led observers to call in some cause auxiliary to water, to produce them. No theory is more plausible than that which supposes the bowlders to have been enveloped in masses of ice, and by them transported to their present situations. This will certainly account for the removal of large rocks to a great distance; and perhaps the occurrence of large broken masses of ice, lying upon loose soil, while currents of water are forcing their way among the fragments, may show us how some of those remarkable diluvial elevations and depressions that have been described, were produced. For we find that where mountain streams bring over the land large accumulations of ice, and then force their way, for a few weeks, among these fragments, effects somewhat analogous to diluvial phenomena are the result. And if there has been a rush of water over our continent from the Arctic regions, might it not have drifted down the ice of

the northern ocean? And whenever these waters became quiet, at so low a temperature, must they not have congealed, so as to envelope projecting masses of stone; so that when a new diluvial wave lifted up and urged forward the ice, the bowlders would be carried with it? Or suppose this deluge took place in the winter, when the ice of rivers, ponds, and lakes enclosed many of the loose stones at the bottom; the same effect, viz. the transportation of those fragments, would take place; and they would be dropped at various distances as the ice melted around them, or they met with some obstacle.

These views afford some relief to the mind that feels perplexed by the apparent inadequacy of running water alone to produce effects so powerful as the phenomena of diluvium presents. But we apprehend they cannot relieve the whole difficulty. We can in this way explain the present situation of many straggling bowlders, so remote from their parent rock, and poised perhaps on the top of some almost perpendicular precipice: but we cannot suppose that those vast accumulations of diluvial sand and gravel which we so often meet with, and that too at like distances as the bowlders from the rock whence they were abraded, could have been transported thither by ice. These beds are often of great thickness, and every fragment of which they are composed, bears the marks of the action of water; nor do we know of any possible mode by which they could have been brought into their present situations, except by running water. The great distance over which the fragments must sometimes have been driven, in spite of intervening obstacles, is the only difficulty in the way of this theory: Adopting it, we must also admit that the diluvial currents must have possessed great denuding and transporting power.

We wish here, however, to guard our readers against imputing to us the belief, that all the gravel and bowlders of diluvium were rounded and smoothed by the currents that brought them into their present situation. This is a work that requires the slow operation of water

for centuries: and this we suppose to have been mainly done by the streams that existed previous to the last cataclysm. That event merely removed into new situations and mixed together, the previously comminuted and rounded detritus.

We are glad to find that the gentlemen engaged in the numerous State geological surveys that are now in progress in this country, are carefully examining the phenomena of our diluvium. Professor Emmons, for instance, one of the geologists engaged in the New York survey, in his recent Report, describes a peculiar feldspathic granitic rock, as occurring in the county of Essex, in the north-east part of the State, where it forms ledges. This rock, containing the beautiful Labrador feldspar, can hardly be confounded with any other: and its fragments he finds strowed in a southerly direction even as far south as Orange county, 150 miles south of Essex.*

W. W. Mather, Esq., another of the New York State geologists, has made some interesting statements respecting the diluvium of Long Island, in his late report. Commencing with the eastern extremity of the island, he says, "that as we advance westward from Montauk Point to Brooklyn along the north shore, there is a regular succession of the groups of bowlders, pebbles and gravel, corresponding to the successive changes in the rocks on the north side of the Sound. For example, the bowlders on the east end of Long Island are like the granite, gneiss, mica slate, greenstone and sienite of Rhode Island and the east part of Connecticut; further westward, opposite New London and the mouth of Connecticut river are bowlders like the New London and Connecticut river, granites, gneiss, and hornblende rock; opposite Newhaven, are found the red sandstone and conglomerate, fissile and micaceous red sandstone, trap conglomerate, compact trap, amygdaloid and verd antique; opposite Black Rock are the granites, gneiss, hornblende, quartz and white limestone, like those in Fairfield county; and from Huntington to Brooklyn,

* First annual Report of the second Geological District, p. 109. Albany, 1837.

the trap, red sandstone, gneiss, granite, hornblende rock, serpentine and crystalline limestone, are found identical in appearance with those of the country between New Jersey and Connecticut. These blocks, bowlders, &c. are in a southerly direction from known beds on the mainland, and this direction is generally different from the line of bearing of the strata."*

We would here refer again to the statement of Prof. Henry D. Rogers, which we quoted in a previous number, respecting the country around Niagara Falls. "The whole of this region," says he, "has been grooved and scarified by the same far-sweeping currents which denuded the entire surface of North America, and strowed its plains and mountains with bowlders, gravel and soil, from the north. Such a diluvial valley, of greater or less length and depth was, I cannot help believing, probably the commencement of the present remarkable trough below the Falls."† In giving an account of a certain district in Virginia, Prof. William B. Rogers says, "A surface more generally undulating, and strowed with water-worn fragments of stone, sometimes of considerable size, marks our approach to the region of hills and rocks, whence these memorials of the destructive forces of a former period have been derived. The superficial strata in the western portion of this district is generally a course sand or gravel, often containing large masses of rounded sandstone and other rocks, of which the parent strata are generally to be found at no remote distance to the north-west."‡

It is well known that the vast country between the Alleghany mountains and the great lakes is based for the most part on fossiliferous rocks. But strowed over the surface are numerous bowlders of granite, gneiss, hornblende rock, argillaceous slate, &c.§ Yet on the

* First annual Geological Report of the first Geological District of New York, p. 88. Albany, 1837.

† American Journal of Science, Vol. XXVII. p. 329.

‡ Report on the Geological Reconnoissance of the State of Virginia, p. 16.

§ See the papers of the Messrs. Lapham, and of Dr. Hildreth, in the American Journal of Science, Vols. XXII. and XXIX.

south side of the lakes, these rocks are not found in place. Hence these erratic blocks have always excited much attention, and many conjectures have been made as to their origin. Now it appears from the researches of Dr. Bigsby, that a range of these primitive rocks can be traced through the Canadas, from the Saguenai river, 100 miles east of Quebec, to Lake Huron.* Other observers have described these rocks still further to the west, as on the north shore of Lake Superior, and even beyond the Lake of the Woods. Nay, Dr. Richardson describes the northern ranges of the Rocky mountains on Mackenzie's river, as composed of primitive rocks. Can there now be any doubt whence the bowlders of the same sort in Ohio and Illinois, significantly called the *lost rocks*, originated? There is but one opinion among geologists, and that supposes them to have been drifted southerly across the lakes, from this vast range of primitive rocks, which probably stretches across the whole continent.

The manner in which ridges of diluvium mixed with bowlders is disposed, affords sometimes a distinct indication of the direction of the current that piled it up. Only a few examples of this sort have yet, however, been pointed out. "M. Brongniart," says Rozet, "has found these blocks (erratic blocks) in the environs of Elsinborg; he has seen them scattered in the soil of Skania (a province of Sweden), and forming also small hills, to which the Swedish geographers give the name of *Ose* and *Sandosar*, according to the predominance of sand or blocks; for in these ridges he always found a certain quantity of sand. These elongated knolls, which the learned Professor compares to masses of melted iron, have a constant direction of N. N. E. and S. S. W.; that is, they are real trains of transported matter arrested by obstacles, as often happens in the beds of rivers."†

In his recent Report on the Geology of Maine, Dr.

* Philos. Magazine, Vol. II. No. 3, p. 219.

† Traité Elementaire de Geologie, par M. Rozet, p. 270. See also Brongniart's Tableaux des Terrains, p. 78.

C. T. Jackson has described a phenonemon apparently of the same nature. In that State, especially in the region of New Limerick and Houlton, he describes a ridge of diluvial matter, called *Horseback*, which "consists of sand and gravel, built up exactly like the embankments for rail roads, the slope on either side being about 30°, while it rises above the surrounding low-lands to the height of thirty feet, its top being perfectly level and wide enough for two carriages to pass abreast." The Horsebacks of New Limerick and Houlton are much more elevated; and some of them are said to rise to the height of ninety feet. Those which I examined, however, were not more than fifty feet high."* These embankments have a north and south direction, and the fragments of rocks composing them, correspond with rocks in place to the north; hence Dr. Jackson very reasonably refers them to a diluvial origin. The fact that their longer axes lie in the same direction in which the bowlders have been transported, shows that both results have been produced by the same agency.

Such are some of the most striking examples that have been hitherto described of the diluvium of the northern parts of this continent; and they lead the mind irresistibly to the conclusion, that a northerly current has, at no very remote epoch, swept over the surface, accompanied probably by great masses of ice. We will not say that there are no facts on record which seem to indicate a different direction to the current; but they are certainly very few. And they may all be explained, either by local causes, deflecting the current in particular places, or by subsequent alluvial agency, or by sup-

* First Report on the Geology of Maine, p. 64 and 65. In a letter just received from Dr. Jackson, dated June 22, 1837, he describes another of these Horsebacks in Corinth, running N. N. W. and S. S. E., six miles long, and elevated fifteen feet above the cedar swamps on either side. He adds, "I think that this ridge was originally diluvial, and that it was subsequently washed by the waves of two large and shallow lakes, that once existed over the land now crowded with cedars and covered with peat."

posing reflux currents in the same deluge, or by admitting the occurrence of more than one deluge, or, finally, by our ignorance of the geology of regions whence bowlders might have originated. Let us refer to a single example, which at first view seems like an exception to the southerly drift of diluvium. Professor Emmons, in his recent Geological report, states, as we have recently mentioned, that from the peculiar granitic rock in Essex county, New York, containing Labrador feldspar, bowlders have been abundently strown in a southerly direction from the bed. He states that they occur also in St. Lawrence Co. on the river St. Lawrence, near Ogdensburg, which lies north-east from Essex. And he supposes that these "were by some means washed over the ridge into the basin of the St. Lawrence, or they might have drifted from Labrador on masses of ice."* We beg leave to suggest an explanation more consistent with the general fact taught us by the details that have been given, that the direction of the diluvial current was generally a little east of south, and rarely if ever west of south, as it must have been to bring bowlders from Labrador to Lake Ontario. D. Bigsby has described a similar rock on the north-east side of Lake Huron; and he infers, that "the fixed rocks consisting of this mineral, with which I met in Lake Huron, are only the southern portion of a large deposit situated in the unexplored forests included between lakes Simcoe, Huron, Nipissing and the Ottawa on Grand River." And he further says, that this rock "is traced," (in bowlders we suppose), "rapidly diminishing in quantity, across Lake Simcoe to Ontario. Even as far down the north shore of Lake Ontario as Kingston, solitary masses may be observed."† Can there be any doubt now, whence came these peculiar bowlders in the valley of the St. Lawrence? But if this rock had not been as it were accidentally described on the shores of Lake Huron, we might have attempted in vain satisfactorily to re-

* Geological Report, p. 110.

† American Journal of Science, Vol. VIII. p. 66.

concile the facts with the southerly direction of the diluvial current.

In Europe the phenomena of diluvium have been studied with great care; but they appear to be more complex than in those parts of this country that have been examined. The general results, however, seem to be now made out with a good degree of certainty. We shall give them in the words of Mr. De La Beche. "In Europe," says he, "we have at least two accumulations of erratic blocks, produced, judging from their geological position, at comparatively recent periods. One set of erratic blocks has been scattered from the central Alps outwards, on each side of this chain; the other has proceeded from a northern direction southward. How far the events which have produced both accumulations of these blocks may have been separated by time from each other, we know not; but we are certain that the geological epochs of both must have been very recent, since they both rest on rocks of little comparative antiquity." After shewing how the elevation of the Alps might have produced the diluvium in their vicinity, he proceeds: "The other great accumulation of erratic blocks seems due to some more general cause, since not only are the blocks scattered in great abundance over northern Europe, in a manner to show their northern origin, but those which occur in the northern parts of America apparently in equal abundance also point to a similar origin. We hence infer, that some cause, situated in the polar regions, has so acted as to produce this dispersion of solid matter over a certain portion of the earth's surface. We know of no agent capable of causing the effect required, but moving water." *

In Great Britain the direction in which the diluvium and bowlders have been drifted, is, for the most part, east of south; corresponding with their course in this country.† On the continent of Europe, the fragments

* Researches in Theoretical Geology, p. 318 and 319. Amherst, 1837.

† Philosophical Magazine, Vol. II. New Series, pp. 140, 150.

of the rocks of Norway and Lapland are strowed over the plains of Germany; and Prof. Alexander Brongniart, who has studied them carefully, describes them as having moved from N.N.E. to S.S.W. But we have not room for details; and must refer for these to the authorities in the margin.*

In the northern parts of Asia, observers declare that similar evidence presents itself of the southerly direction of the diluvial currents. One geological writer states, that in Russia "the tops of various sorts of trees (buried in the diluvium) lie towards the south-east and the south-west. The force which overturned or transported them had, therefore, a direction from north to south. These fossil trees show themselves in all the north part of Russia, both near to, and far from rivers, and are covered by a great thickness of sand."† That part of the world, however, has not been examined with the care requisite to obtain much certain information respecting its diluvial phenomena. The central and southern parts of that vast continent are still more *terrae incognitae* as to this matter. As yet we get only detached facts, which tend to the conclusion that diluvial agency has been similar there to its character in other parts of the globe. Even in some portions of the world that have been examined, particuliar districts are almost destitute of the marks of its operation. It is said that erratic blocks are wanting in the Pyrennes, the Appenines, the Carpathians, and the mountains of Bohemia.‡ It is probable, however, that their number there is merely less than in other mountains, as seems to be the case in some of the more southerly districts of our own country.

It is very natural for the Christian geologist to desire to know whether the region around mount Ararat pre-

* *Traité Elementarie de Geologie par M. Rozet*, Tom 1. p. 270. Paris, 1835. See also the *Tableau des Terrains*, by Alex. Brongniart, and the Reliquiae Diluvianae of Dr. Buckland, where a vast number of facts are given respecting diluvium and erratic blocks.

† Traité Elementarie de Geologie par M. Rozet, p. 272.

‡ Elemens de Geologie, par M. Chaubard, p. 280. Paris, 1832.

sents any diluvial phenomena. Prof. Parrot, who was the first to ascend this mountain and ascertain its height, has perhaps given us a glimpse of light on this subject. "I was," says he, "at the foot of mount Ararat, the mountain of the patriarch Noah, whose barren and thirsty soil even now shows indisputable traces of the flood." This barren and thirsty soil corresponds very well with most of the diluvium in this country. But we have a few more facts to state on this point. Just before the Rev. Justin Perkins, now missionary at Oormiah in Persia, left this country, when he was connected with Amherst college as an instructor, we took him to a locality in the vicinity of that institution, where exists a striking example of diluvial elevations and depressions, composed of sand and gravel, and requested him, when he should come into the vicinity of Ararat, to observe whether any similar appearances presented themselves. He was not forgetful of his promise; and in a letter dated at Tabreez, in Persia, Dec. 25, 1834, gives the following description: "We had near, advantageous, and delightful views of mount Ararat, on our way to Persia. It is altogether unique in its appearance, and a very beautiful, as well as most impressively sublime object. We saw its towering summit several days before we reached the mountain, over-toping all other mountains, far and near. When within about sixty miles of it, we had our first distinct view of the whole mountain; and so lofty is it, that it appeared within eight or ten miles of us; and we could scarcely be persuaded of our distance from it. Our nearest view was at the village of Khorvirab, about two miles from the base. The river Aras (ancient Araxas), rolled between us and the mountain. The higher Ararat is in shape almost a perfect cone. The upper part—about one third of the whole—is covered with eternal snow. The thermometer (Fahrenheit) ranged from 95° to 105° when we passed it, (Aug. 11 and 12), and yet the scorching sun, under which we almost melted, seemed not to make the least impression on the hoary shroud of Ararat. The snow on its top and sides

appeared of immense depth, and perfectly smooth, as though never broken or ruffled by the track of man, beast, or bird. On the lower Ararat, when we passed it, the snow lay only in patches."

"An immense plain,—at least fifty miles in length, and from ten to twenty miles in breadth,—perfectly level and extensively fertile, stretches along the north and east sides of the mountain. At the north-east extremity is the city of Erivan. Twelve miles to the west is Etchmiadzin, the celebrated Armenian convent, and the ecclesiastical metropolis of that nation. Around this plain are mountains hanging in broken, irregular piles, and indicating terrible commotions to heap them into their present form. At a distance they appear like ledges of lava, but as you approach them, you generally find that their volcanic aspect is the effect of their naked exposure to the scorching sun. Further back from mount Ararat, we passed many sections of diluvium, much like the one we visited back of Amherst." *

Concerning diluvium in Africa, very few accurate

* We have a sketch of mount Ararat, which was taken by Mrs. Perkins, as she, with her husband, passed it at the date mentioned in the text. The following note was attached to it by Mrs. Perkins:

"This view of mount Ararat was sketched at the village of Khorvirab, about two miles east of the base of the mountain on the opposite side of the river Aras, (ancient Araxas.) On a mound, near this village, is a very ancient and celebrated Armenian Church." C. B. P.

We are aware that several views of this mountain have been given by travellers; though we have not been able to compare the one in our possession with any except that of Morier, as given in Finden's Landscape Illustrations of the Bible: and that view appears to have been taken from a much greater distance and in a somewhat different direction. But without presuming that the view by Mrs. Perkins is more accurate than others, it is deeply interesting as the work of probably the first American lady whose eyes ever rested on Ararat, and she bound on an errand of benevolence.

Specimens of genuine lava, taken from the base of the mountain, and forwarded by Mr. Perkins, confirm the statement of Professor Parrot, that it is of volcanic origin, and probably the mountains which Mr. Perkins describes as appearing like lava, were really volcanic.

observations have yet been made. Professor Rozet describes the plain of Metidja, lying south of Algiers, to be covered in its northern parts with bowlders from a low chain of hills lying to the north, while its southern parts abound with bowlders from a part of the Atlas chain, which extends along its southern borders; so that the same phenomena occur here, as in the region of the Alps, where the bowlders are scattered from the central parts of the chain outwards. We have some doubts, however, whether the region of which we speak in Africa has been examined with sufficient care to enable us to infer with much certainty what are its diluvial phenomena. Of all geological observations those upon diluvium require the greatest care; and the most thorough acquaintance with the topography and general structure of the surrounding regions. There is very little chance that any traveller, however well acquainted with rocks, can infer any thing at all by merely passing once or twice through a country, respecting its diluvium. He must go over it a great number of times, and in various directions, to arrive at any certain results. Hence it happens, that while almost every part of the surface of the globe has been penetrated, our knowledge of its diluvial phenomena, with the exception of a belt across the northern parts of the northern hemisphere, is so very meagre. It is only in respect to the northern parts of the northern hemisphere, that we can infer with certainty that the course of the diluvial currents was southerly. We might rest on the facts already stated in proof of this. But we have yet presented only one part of the evidence.

2. *The second part consists in the occurrence of scratches and grooves, having a direction nearly north and south, upon the ledges of rocks that have never been moved, and of vallies having the same direction, worn out in the softer strata.*

A person who examines a region abounding with multitudes of erratic bowlders, some of them of great size and weight, can hardly avoid inquiring, whether if they were drifted to their present places by water, they

have not left some marks of their abrading power upon the more elevated solid rocks over which they have been forced. Much would depend, however, upon the length of time that has elapsed since the catastrophe took place, and much upon the nature of the rock in place. For most limestones and shales, as well as sandstones and many trap rocks, are so rapidly disintegrated that a few centuries must suffice to efface marks that were not deeply engraved. And there is probably no rock on which the tooth of time does not make some impression. So that if we should meet with grooves and scratches, corresponding in direction with the course which the travelled bowlders have taken, we may infer that the period when the movement took place could not have been extremely remote. Now we assert that such grooves and scratches are not uncommon. Probably, however, this statement should be limited to our own country. For although a few of them have been noticed in Europe, yet it must be recollected that far more attention has been given to the examination of European, than of American geology; and if these grooves were as common there as in New England, a thousand examples, instead of half a dozen, ere this time would have been pointed out. We will mention the few that we have seen described.

Most geological writers give certain statements of Sir James Hall and Col. Imrie, respecting diluvial grooves and scratchings on rocks in Scotland, not as if they had themselves seen them, but only on the authority of these gentlemen. They are indeed fine examples of these grooves, and correspond almost exactly to multitudes of a similar kind in New England. They occur upon trap and other rocks, and their general direction is north-west and south-east. Many valleys in their vicinity correspond with them in direction. A similar case of grooves has been described by Mr. Underwood, in North Wales, on the surface of slate rocks.* More recently Mr. Murchison has given an account of the

* Reliquiae Diluvianae, pp. 201 and 206. London, 1823.

like diluvial markings on the rocks of Brora district in Scotland, where they run from N. N. W. to S. S. E.* And these are all the examples which we recollect to have seen of this phenomenon in Great Britain.

On the continent of Europe these diluvial traces have been noticed in connection with the erratic blocks that have been described as carried southerly from Scandinavia. Says Rozet, "We see the marks of a kind of rut, left on the rocks in place by the transported masses. The gneiss and granite of the environs of Stramstad, Hogdal, &c. exhibit furrows side by side, of unequal size and depth, whose sides are smoothed, and which run N. N. E. and S. S. W."—He adds, "I am persuaded that by examining with care the surface of rocks in the vicinity of great masses of erratic blocks, we might find similar traces in many countries."†

It is clear from these statements that examples of these traces of diluvial action have been met with only rarely on the eastern continent; and they seem, so far as we can judge, hardly to form an element in the reasonings of European geologists on this subject. And yet, if we mistake not, they do form a very important element, and therefore, we shall be more particular in pointing out unequivocal instances in our own country. And we shall first refer to those cases which our own eyes have seen, and which others can see if they will visit the localities.

Limestone is the only rock occupying much extent of surface on which we have not found these marks of aqueous agency. That rock wears away and disintegrates so rapidly, that we could not expect it would retain any traces that were not very deep, after a few centuries' exposure to the atmospheric agents. Indeed, from certain facts that have come under our notice, in respect to the gradual waste even of the hardest rocks, we are rather surprised that any of them should show these marks, which, in general, are less than an inch in depth, after the lapse of thousands of years; though

* Philosophical Magazine, Vol. II. N. Series, p. 150.

† Traité Elementaire de Geologie, p. 270. Paris, 1835.

we are sure that no deluge has swept over the northern hemisphere at a period later than that of Noah. Yet where a rock is covered with compact soil, or is so smooth that lichens cannot fasten upon it, it will hardly be affected by atmospheric agencies at all, and many of the monuments of antiquity, constructed of porphyry or granite, or even limestone polished, have come down to us in a wonderful state of preservation. But in many cases of diluvial grooves in New England, the rocks on which they occur are by no means free from lichens, and they bear marks of decay; so that the cause that produced the furrows cannot have acted at a very remote period. Sometimes the rock is rounded and smoothed almost to a polish, on its exposed angles, just as the projecting edges of rocks are affected, which are exposed to the force of running water in existing streams, which occasionally sweep along ice, logs, and stones. At other times, slight scratches are visible on the surface of the rock, as if some hard or heavy angular body had been driven over it, while the weight of that body rested upon the rock. In other instances, these scratches, still evidently made by the passage of a single rock, are nearly an inch, sometimes more, in depth. It is not usual for a rock to be laid entirely bare over many yards of surface, and to be so smooth that it will show these scratches continuously for a great distance; and accordingly, they are ordinarily visible only for a few feet, or a few yards; but we have sometimes met with a surface several rods in extent, entirely covered with furrows; and were the surrounding soil to be removed, we have no reason to doubt but many acres would be brought to light of large areas furrowed throughout. In other cases furrows several inches wide and as deep, are seen; but these are evidently the result of forcing a succession of bowlders and pebbles over the spot. And even where the scratches appear as if produced by a single bowlder, we have little doubt but there had been not a little abrasion previously on the same spot; for the entire surface is often made as level almost as the floor of a house.

Upon the whole, the highest parts of hills and mountains present the best examples of these furrows. But they are exhibited with nearly equal distinctness on the northern and north-western sides of mountains where the slope is not very great. On the opposite slopes, unless they are very gentle, we have rarely met with good examples. In low grounds they are not very common, unless there be a valley of considerable width, where we have met with them. In the cases which we shall now proceed to mention, we shall feel quite sure that we have not mistaken veins of segregation, or lines of clearage, for these ridges and grooves. We shall refer to no case, in which, if a rock is stratified, the grooves do not cross the lines of stratification and clearage at a considerable angle. In short, every case mentioned below, is as evidently the result of the attrition of running water, as any examples of such action that can be pointed out in the beds and tanks of existing streams; and most of the cases are much more striking than any of this sort that we have seen. We make these remarks, because we have found many very jealous that we had mistaken clearage lines and segregated veins for diluvial furrows. But we only ask that such will accompany us to the localities referred to below; and we are sure that they will at least acknowledge that the furrows must have been produced by running water. It is easy for a man, reasoning upon such phenomena as these in his study, about which he is sceptical, to persuade himself that an observer has been mistaken; since it does really require considerable practical knowledge of rocks to avoid mistakes in this matter. But it is certainly reasonable that such a man should examine the spots referred to, before he maintains such an opinion publicly. And this is all we ask: for a single glance of the eye will carry stronger conviction to the mind than all the pages which we have devoted to this subject.

The region within and around Portland in Maine, is, upon the whole, as good a spot as we have examined for exhibitions of this phenomenon; although the coun-

try there is by no means elevated. Yet the rock is of a character that is very little liable to disintegration. It consists chiefly of talcose and mica slates, standing on their edges; yet the layers are so closely united, that when worn smooth upon the edges, the fissile character of the rock almost entirely disappears, and we have a surface as unbroken as that of abraded porphyry, or trap. This slate, however, is much softer than the rocks just named, and therefore the scratches and furrows are very distinct. They are often, indeed, as distinct, though not so large, as the tracks of a sleigh on fresh fallen snow. They are also remarkably uniform in direction; running south from 10° to 15° east, although distant from one another several miles. For they occur not merely on the peninsula of Portland, but in Westbrook, which lies west of the city; and on the road to Yarmouth, a few miles north of the city. On Cape Elizabeth, opposite to Portland, we found a tolerably good example. In short, wherever the peculiar slates above described are found, these grooves may be discovered. But if we go a few miles from Portland, in a northerly or north-westerly direction, we soon come to rocks whose surfaces are so decomposed that all traces of diluvial action are obliterated. It is not necessary, however, to go beyond the peninsula on which the city stands, to find very good examples of these furrows, especially along the shores in the north-east and south-west part of the town. We even saw some examples in the streets not yet obliterated; although travelled over daily by so many; as for instance, on the north side of Elm street, a little east of its intersection with Cumberland street, and in Fore street, near where Silver street intersects it. *

We have examined the country eastward of Portland but a short distance. But Dr. C. T. Jackson has furnished us with some very striking examples of this kind as far east as Penobscot river, which we may as well quote in this place. "In Belmont, on the right hand

* See more on this subject in the Boston Journal of Natural History, Part I. No. III. Boston, 1836.

side of the road," says he, "we observed some well defined diluvial marks on the slate running north-west and south-east, and crossing the lines of stratification."* Again he says, "Diluvial grooves in the rocks are exceedingly common in Maine; but I know of few localities where they are so distinct as at Hope and Appleton. Here they may be observed running in a north-west and south-east direction, while they are very deep and perfectly defined. Their direction, it will be remembered, does not coincide with that of the stratification of the rocks, and could not have resulted from disintegration of the different strata. Three quarters of a mile south-east from a hill in Appleton, they may be seen forming deep channels in the rocks, to the depth of a foot, and six inches in width. Since the direction and appearance of these grooves correspond with those observed in other parts of our country, I feel no hesitation in attributing them to a similar origin. They are certainly the result of an aqueous current, which once prevailed over New England, and probably over the whole world." †

* First Report on the Geology of Maine, p. 57.

† Same work, p. 59. In a letter received while we were preparing this article (July 1837), Dr. Jackson has given some further interesting statements respecting diluvial grooves and scratches in Maine, discovered by him this season. He says, "The diluvial phenomena which I have before mentioned, are the most perfect diluvial furrows and scratches upon the surface of the slate rocks, *running for two or three miles continuously* across the edges of the strata, making with them an angle of 75°. I measured the direction of the grooves in many places, and found the medium to be South 15° East. The deviations are rarely more than 10°, *i. e.* S. 10° E. and S. 20° E. are the extremes. The bowlders on the surface are granite, which I think is identical with the variety found at Lubec Pond, situated eight or ten miles N. N. W. from Atkinson. Some of the scratches run up hill at an angle of 15° or 20°, others are on the top, and others down its slope. The largest bowlders are on the N. N. W. side of the hill. The grooves are of various depths and widths, from one eighth of an inch to an inch in depth, and from the same width to trough-shaped excavations a foot wide and an inch deep. The most sceptical would here be convinced that these marks were made by the rushing of a diluvial current over the land since the elevation and consolidation of the strata."

We have already described the powerful effects of former diluvial agency in the removal of bowlders and the accumulation of diluvium in the eastern part of Massachusetts. Correspondent furrows in the rocks are not wanting. Even the hard sienite of Cape Ann, often rounded and smoothed apparently by water, shows these furrows sometimes; as for instance, in one of the streets of Marblehead, a few rods south-east from the residence of the late Hon. William Reed, and near a church, where they run only a few degrees east of south. And it may be remarked that in general this is their course in the eastern and central parts of Massachusetts. Such we have noticed on the granite and sienite along the turnpike road from Boston to Andover: Also on the same rocks in Abington, Randolph, Canton, Sharon, Dedham, and Dover; near Hanover Four Corners, and at Fall River, in Troy, where we see bowlders lying on the surface that made the furrows, or might have made them, from fifty to one hundred tons in weight. We have noticed a very distinct case on gneiss rock on the turnpike from Boston to Chelmsford, near the sixteenth mile stone, from Boston. They are not uncommon on the coarse conglomerate rock in Dorchester. Even near the summit of Wachusett, which is a conical elevation of gneiss 3000 feet above the ocean, and 1900 feet higher than the surrounding country, we observed some rather indistinct traces of the same kind, especially on the north-west side of the elevation. In passing from Worcester towards Berlin, the gneiss and mica slate are frequently seen thus scored; as is the gneiss at a much higher elevation in the centre of Rutland and Petersham. In Westford, one mile north of the meeting-house, on the road to Dunstable, is a fine example on mica slate. On the coarse conglomerate rock, three or four miles south-east from Newport, Rhode Island, near the singular excavation called Purgatory, we noticed grooves running south from 10° to 20° E. But perhaps the sandstone, conglomerate, and greenstone of the valley of the Connecticut, afford more numerous examples than almost any other part of New Eng-

land. They occur at all heights up to 500 feet above the present bed of the river. Mount Holyoke and Tom, which present a precipitous curved ridge of greenstone, from 200 to 900 feet above the river, and from twelve to fifteen miles in length, exhibit most remarkable effects from aqueous agency. At the eastern extremity of this ridge, its direction is nearly east and west; but as it approaches the river, it curves southerly, so as to change its direction nearly ninety degrees. Its summit presents frequent examples of smoothing and grooving by bowlders, some of which, even six to eight feet in diameter, still remain poised upon the top. It is also cut through by numerous valleys, certainly more than fifty,—whose depth varies from five to 200 feet, which appear most of them, much like the beds of small streams that have been long since abandoned; the sides being nearly perpendicular, except that loose rocks have fallen down to form a sort of talus or slope. Now that these valleys received their present form by former aqueous agency, is evident from the fact, that they all run nearly north and south. This direction runs across the ridge at its east end nearly at right angles; but owing to the curvature of the mountain towards the south-western extremity, the valleys there coincide nearly in direction with the ridge. We do not, indeed, suppose that the deepest of these valleys could have been excavated entirely by aqueous agency; and yet the fact just mentioned, shows that they all must have been powerfully modified by this cause. But we shall not attempt a full account of this most remarkable case; for it would demand diagrams to render the facts and reasoning intelligible; and would with more propriety be developed in a scientific journal. Some would doubtless impute these valleys, as well as all other marks of aqueous agency in this valley, to the former action of Connecticut river; and on this account we shall not dwell upon them; though we are prepared to demonstrate that this is a very improbable, we had almost said, a ridiculous supposition.

As we pass to the mountainous regions west of Con-

necticut river, we find diluvial grooves in situations which no observer will imagine for a moment could have been exposed to the action of rivers. For we here find ourselves amid a sea of mountain peaks and ridges, whose tops present the most striking examples of these furrows, and probably but few of them are less than 1000 feet above the ocean; and some of them are 2400 feet above that level. As we go westward from Connecticut river, we pass over a succession of irregular ridges, more and more elevated for twenty miles, until we reach the highest ridge, called Hoosack mountain; which, on its west side, suddenly sinks into the valley of Berkshire, which is almost as low as that of Connecticut river. Some of the ridges on the east side of the Hoosack almost rival it in height; yet on these we frequently find very striking examples of diluvial furrows. When we have reached the meeting-house near the centre of Blandford, for instance, we find ourselves looking abroad over a vast extent of hilly country, and we cannot be less than 1500 feet above the ocean; yet passing half a mile north from the meeting-house, where the rock slopes to the north, we meet with some most distinct grooves in the mica slate, or rather on its smoothed edges. Standing in such a spot, the observer feels certain that no river could ever have passed over it. A similar impression is made upon him, as he sees similar markings on the insulated mountain four or five miles south of Massachusetts, in Canaan, Conn. He may see them, also, near the meeting-house in Norfolk, in the same vicinity; which spot, however, is not so elevated. But passing still further south to an elevation called mount Tom, in the west part of Litchfield on the turnpike to Newburgh, just as he begins to descend towards the west, from the highest ridge between Connecticut and Hudson rivers, he will notice these scorings on the gneiss. Their direction is S. 10° to 15° East. If he goes to the northern parts of Massachusetts, on the same mountainous range, he will find examples fifty rods south of the meeting-house in Heath; also near the meeting-house in Rowe; and

particularly in the north part of that town, on a hill that rivals even Hoosack mountain in height. Proceeding into Vermont, as he passes from Whitingham to Wilmington, still upon the same elevated mountain range, he will observe examples. We might have mentioned also, the centre of Middlefield, in Massachusetts, whose elevation is almost Alpine, as another place for observing them.

Hitherto the grooves that have been described upon the Hoosack range have a direction ranging but little from north and south. But we have described some very striking cases of travelled bowlders in that region, which came from the north-west. And in perfect correspondence, as we come upon the most elevated parts, both of the Hoosack and Taconnic ranges, we find the general course of the grooves to be north-west and south-east. Where the turnpike from Greenfield to Albany crosses the former mountain, whose top at this place is three or four miles broad, we meet with several examples. They are not, however, as distinct as in Windsor, a few miles farther south; where we meet with them for three or four miles, as we travel easterly from the meeting-house; although at this place there is somewhat of an easterly slope to the surface. Still further south, lies Peru, whose meeting-house stands so exactly upon the top of the ridge, that it is said the water that descends from the western slope of its roof runs into Hudson river, and that from the eastern slope into the Connecticut. Near this meeting-house are frequent scratches, that have a south-east and north-west direction. But if we pass easterly towards Worthington, after descending for a while, we ascend a long and high hill; and as the rock is here laid bare very much, we find these grooves almost continuously for a mile or more. In like manner, as we pass over the Taconnic mountain from New Lebanon to Pittsfield, but little less elevated than the Hoosack, (which at some of the localities mentioned cannot be less than 2400 feet above the ocean,) we find towards the top, on both slopes, but particularly on the west side, frequent examples of the phenomenon under

consideration. In crossing the same range from Hillsdale to Egremont, the western slope of the mountain, near the top, abounds with these furrows, which run, from N. 55° W. to S. 55° E. In crossing the graywacke formation between the Taconnic range and Hudson river, we find frequent examples where the course is almost exactly north-west and south-east. These are so common, where the rock is not disintegrated, that it is unnecessary to specify localities.

It is not in all cases, however, that the grooves in the region under consideration have a north-west and south-east direction. The highest mountain in Massachusetts is Saddle mountain in Williamstown; but its highest point, Graylock, is so much covered with soil that we have not been able to find any grooves. That part of the mountain called Bald mountain, show some markings, and these run nearly north and south. This point is several hundred feet below Graylock. In passing from Williamstown towards Cambridge, through a broken but not very elevated path, near the banks of the Hoosack river, the grooves on talcose and argillaceous slate in Pownal, Hoosack Four Corners, &c. run nearly north and south. We noticed them, also, on the west bank of Hudson river near Waterford, having the same direction. Thirty or forty miles south-east from Waterford, on the graywacke in Hillsdale, their direction is N. 15° W. Still farther south, on the mountain in the west part of Dover, their direction is nearly north and south, on talcose slate; as it is at the western base of this mountain on argillaceous slate. So also in Windsor, Massachusetts, in the north-west part of the town where the Hoosack mountain descends north-westerly, they have the same course.

These facts have suggested to our minds a possible explanation of the diversity in the direction of the diluvial current that passed over New England. In general those marks that occur upon the highest elevations have a direction nearly N. W. and S. E. while those at lower levels come nearer to a coincidence with the meridian. Now suppose a sheet of water to come pouring over this con-

timent from the north-west, and to increase until it had overtopped all our mountains. In New England the general course of our valleys is north and south. The water, therefore, as it reached valley after valley through breaches in their sides, would be turned at first more towards the south, so as to follow the valleys. But when it had risen nearly to the summit of all the hills, it would then pursue more uninterruptedly its original course. Or suppose this process to be reversed; that is, suppose a deluge, moving with great velocity from N. W. to S. E., and rising above the mountains, should begin to subside, the current still continuing, it is clear that the same diversity as to the course of the markings upon the rocks would be produced as in the first supposition. This, however, is to be regarded only in the light of an hypothesis.

In our western and southern states we know of but few facts that have been made public respecting diluvial grooves and scratches. Judge Thompson, however, seems to have observed them with a good deal of care in Sullivan, one of the southern counties of New York, bordering upon New Jersey and Pennsylvania, and generally elevated 1500 feet above the Hudson. He says, "I have found that in more than fifty different places, where I have seen the solid strata, the grooves and furrows appear from an inch to one-fourth of an inch deep, and from one-fourth of an inch to three and four inches wide; and in some cases they run due north, and in every direction from north to 25° south of east."* Local causes in that region seem to have deflected the current often to a great extent; as an instance of which he says, "If the slope or side of the hill faces the north, I have seen three or four instances in which the furrows run in that direction for half a mile, and on meeting a ridge of rocks in the low grounds, the furrows turned due east, and after passing the obstruction again turning north-east or east."† Again he says, "On the high lands west of the Shongham, and where there could be no

* American Journal of Science and Arts, Vol. XXIII. p. 243.
† Same work and Vol., p. 246.

obstruction for seventy or eighty miles, I examined ten or twelve different places in which the furrows were deep and distinct, and found them to run from 10° to 12° north of east; at no great distance to the south the furrows tended 25° south of east, leading to a low opening in Shongham mountain, through which the currents of water naturally run."* We find also a statement respecting furrows examined at Lockport and Brockport by David Thomas, Esq. Engineer, in excavating for the Erie Canal, the direction of which was 25°, and in one instance even 80°, east of north. These were on limestone and sandstone; and being at so low a level, might possibly have been the result of alluvial agency.† At any rate, we think these few cases that are somewhat anomalous, cannot invalidate the great mass of evidence we have presented, that the diluvial current had a northerly direction; or rather, we are inclined to say a north-westerly direction; for such appears to have been its course when it had attained the height of our highest mountains, and local obstructions were not in the way. To the examples of this description already stated, we might add one from John Ball, Esq., who found scratches upon a mountain in Hebron, New Hampshire, on gneiss, running S. 60° E.; and he afterwards found that most mountains in that vicinity show similar scratches.‡ We have, also, the testimony of Dr. De Kay, as to the furrows on the primitive rocks in the vicinity of the city of New York, who represents them as having an invariable N. N. W. and S. S. E. direction.§

We fear that our readers will be quite wearied out by so many details. But we do not suppose that any one can form a correct opinion on this subject without a pretty extensive acquaintance with facts; nor are we aware that such a summary of them as we have now presented can be found; indeed, many of them have

* American Journal of Science and Arts, Vol. XXIII. p. 247.
† Idem, Vol. XVII. p. 408.
‡ Idem, Vol. XXII. p. 266.
§ Idem, Vol. XVI. p. 357.

never before been made public. And as to the phenomena of furrows on the rocks, we suppose that they are very important to be taken into the account in coming to a conclusion respecting the occurrence of a deluge; and that they modify the results obtained by diluvial phenomena in Europe. We shall now see in what manner.

We apprehend that most intelligent men who examine the facts we have presented carefully, will feel as if there could not be much doubt respecting the occurrence of a general deluge in the northern hemisphere in comparatively modern times. Yet this conclusion is denied at this day by some very able geologists. They of course attempt to explain the facts respecting diluvium in some other way. Let us see if any of their explanations will account satisfactorily for the facts in our country.

Some suppose that the former action of rivers and other agents now in operation, is sufficient to explain most cases of diluvial accumulations and bowlders. It should be borne in mind, that what we want is, to account, not for the original production of diluvium and bowlders, but for their present situation. That rivers, rains, heat, and cold, originally tore from their beds and rounded them by a slow operation, is readily admitted; but what agency, almost without reference to the courses of rivers and valleys, has taken those rounded and abraded fragments and driven them pell-mell in a southerly direction? It will hardly be contended that existing rivers have done it; but might not former streams have run at a higher level, or has not the surface since been elevated? Admitting all this, the explanation is inadequate. To say nothing of other continents, we have shown that from the extremity of Nova Scotia to the west side of our great lakes, a distance from 1200 to 1500 miles, there are evidences of this southerly drift by a powerful current. Unless, therefore, former rivers were of this width, that is, unless all the northern parts of our continent formed the bed of one vast river, the work could not have been accomplished.

Some suppose diluvial phenomena may be explained by the bursting of lakes, which are elevated above the general level, or by the pouring of the ocean over tracts depressed below its surface. Devastation has, indeed, sometimes followed the bursting of a lake over a limited district. But where could the lake have been situated whose liberated waters overwhelmed a continent? We know that it is a favourite hypothesis with some, that the vast basin in our country between the Alleghany and Green Mountains on one side, and the Rocky Mountains on the other, embracing an area of nearly 1,000,000 square miles, was once an inland sea, elevated above the general level of the ocean; and that the barriers which enclosed it have been burst. We find less difficulty in admitting the former existence of such a sea, than in conceiving how the draining of it could have produced the phenomena of diluvium. Dr. Mitchell, of New York, who made great account of this inland sea, represents its barrier to have been broken through by its waters in no less than eleven different places. Now we should like to know how a lake, after breaking through its barrier in one place, and thereby necessarily lowering the level of its waters, is able to regain a higher than its former elevation, in order to break through the barrier in another place. Some rare examples may perhaps be found, in which a lake has two outlets; but who ever heard of one with half a dozen outlets? The chances against such an occurrence become very soon almost infinite, as the number of outlets is increased. But even if such a state of things be admitted in regard to the great supposed western lake, it will not account for the phenomena of diluvium in our country. For how happened the currents to have had, with few exceptions, the same direction, and especially, how could the passage of the waters through ten, or a hundred, or a thousand outlets, have streamed over the entire surface of New England with diluvium, and left so large a part of it scarified and furrowed?

If a tract of country were depressed below the ocean's

level, and its surrounding barrier broken through, the waters would pour in with violence. But there is no evidence that any such event has ever taken place, nor that any such depression ever existed on a large scale; and there are many presumptions against the occurrence of such a state of things. Besides, unless the depressed and inundated tract were subsequently elevated, the marks of the catastrophe would be mostly buried beneath the waters; and we shall endeavour to show that there has been no material change of levels since the last diluvial action took place.

Others impute diluvial phenomena to the original elevation of the strata. That our present continents have been raised up from the bottom of the ocean, seems to be a fact scarcely admitting of doubt; at least not doubted by geologists. And if such an elevation were sudden, it is clear that the retiring waters must have swept over the surface with great power. Nor are we disposed to doubt at all that such powerful currents from this cause have been frequent on the globe. But we doubt whether the last diluvial catastrophe was thus produced. We mean that it was not produced by the elevation of the strata in the region where its traces are found. If any maintain that diluvial action in North America, for instance, was the result of an elevation of the bottom of the ocean in some other part of the globe, whereby a wave was thrown over this continent, this is quite a different hypothesis from that under consideration; and we shall not be disposed to contend against such a theory. But we find several difficulties in explaining the facts relating to our diluvium by the retiring waters when the strata of this continent were elevated. In the first place, when a mountain ridge is elevated from the bottom of the ocean, the retiring waters will flow from the ridge on both sides at right angles to its direction. Now in North America, there are several systems of strata, running in different directions; some, as the Alleghany chain, running nearly N. E. and S. W.; others, as most of those in New England, running north and south; others,

S. E. and N. W.; and others, east and west. According to the most probable theory, these different systems must have been raised at different times; and of course would produce currents in different directions. But in order to meet the case of our diluvium and bowlders, we want some cause that shall produce a current in one direction, over all these systems of elevation. Secondly, we have good reason for believing that neither the relative nor absolute levels of the surface have experienced much change since the epoch of the last deluge. First, as to relative levels; we find accumulations of diluvium just in those situations in which we should expect they would be piled up by water flowing over the present surface; and those diluvial elevations and depressions are generally in the vicinity of some gorge, where a current would be subject to irregular, violent, and eddying currents. Again, where bowlders are strewed over the surface, if a mountain be so situated that the diluvial current impinged against it, and could not turn to the right or left, we find the bowlders accumulated over the base of the mountain, just as would happen if the mountain had stood there when the current passed over the surface; and hence it seems reasonable to infer, that it did stand there. Still further, we find grooves and furrows much more frequent, distinct, and numerous, on the northerly, than on the southerly slopes of mountains; a decisive proof that those mountains remain as they were when the current swept bowlders over them.

As to a change of absolute level at or since the last diluvial epoch, two hypotheses have been proposed. Both of them suppose our existing continents to have formed the bottom of the ocean previous to that event; or rather at some unknown period of the past. One hypothesis assumes that by some internal force, or action, this bottom was suddenly raised up to the height of the present surface. The other hypothesis maintains that this elevatory movement has been produced, not by any paroxysmal effort, but by the extremely slow agency of earthquakes; so that for centuries the rise

may not be manifest. On the first hypothesis, what we call diluvial action took place at the time of the elevation, and was caused by it; on the other, it occurred while yet the surface was beneath the ocean, by the ordinary action of its waves and current; so that in fact, the term diluvial is a misnomer. Now it strikes us, that both of these hypotheses are inconsistent with the facts respecting diluvial grooves, and valleys of denudation produced by the same cause. No one, it seems to us, who will carefully examine these phenomena in this country, and who has any acquaintance with geological dynamics, will conceive it possible that all could have resulted from the mere escape of the waters of the ocean from a rapidly rising continent. The currents must have continued longer than the few hours that would have sufficed for this purpose. But waiving this consideration, it is incredible that this continent should have been thus rapidly thrown up so many hundred feet without producing some slight dislocation of the surfaces of rocks that had been abraded by the retiring waters. That is, we should expect to find that one part of the smoothed and furrowed surface would be raised slightly at least above the other part, by sliding along some fissure or seam of stratification. But in the hundreds of cases which we have examined, we do not recollect one where we have seen any evidence of the least change of level of this sort, though we have often seen a surface several rods in length continuously smoothed and furrowed and traversed by fissures and numerous strata seams. Every thing appears as if no movement of any sort had taken place since the abrading action occurred. The rock is often very fissile and easily crumbled into fragments. Can any one believe that such a mass could be lifted one or two thousand feet, and yet the elevating force act with such perfect uniformity upon every part, that no portion of the mass should be forced a little beyond the rest?

The same reasoning applies, though probably with somewhat less force, to an extremely slow elevation of a continent. We can hardly conceive that when this

country was at the bottom of the ocean, it was not as much below the ocean level as it is now above that line; so that the elevation must have amounted to at least 2000 or 3000 feet. And yet, all this takes place without producing any irregular protrusion, not even enough to be observed on a smooth surface, although the rock be full of fissures! If one portion of the mass were to be raised one-half inch more than the remainder, it would form a break on the surface greater than we have ever witnessed. The tops of our highest mountains are often covered over with large angular fragments, apparently the result of their elevation. Is it credible, that in any way they could be forced up by expansive forces within the earth, or by contraction of the internal heated nucleus, and yet no effect be visible upon the surface?

Again, though in all cases of diluvial grooves we perceive some degree of disintegration of the surface, yet there is enough of freshness about them to force the conviction upon the mind that the work could not have been very ancient, especially when we often see upon a rock in the immediate vicinity no traces of diluvial action, because by its character it is a little more liable to decomposition, and the grooves are all effaced. We perceive that it requires but a slight amount of erosion, or disintegration, to produce such obliteration. Now suppose America to have been raised up from the ocean to the average height of 2,500 feet, at the same rate as Mr. Lyell thinks some parts of Sweden are now rising, viz. two and a half feet in a century.* This would require 100,000 years for the rise of our continent. And thus we are carried back to a period when these markings were made upon the rocks, so remote, that the mind, already impressed by examination with the comparative recency of the phenomena, cannot admit it.

Two other facts tend to impress upon us the same conclusion. We perceive a constant accumulation of alluvial deposites at the mouths of rivers, and of soil in

* American Journal of Science, Vol. XXVIII, p. 72.

low grounds; and so rapid are these processes, that during a single generation, the progress is quite sensible. And although we can make but an imperfect comparison between geological processes and chronological dates, yet, as these alluvial depositions must have commenced subsequent to diluvial action, because diluvium lies beneath them, and we perceive a sensible advance even in our short lives, the mind refuses to assign their commencement at a period so almost incalculably remote as this hypothesis of the slow elevation of continents requires. We at once inquire, why low grounds are not all filled up, and why alluvial deltas are not ere this time pushed across wide oceans?

Again, whoever has examined precipitous rocky ridges, especially trap ridges, must have noticed that by the action of frost upon the water that percolates into the fissures of the rocks, fragments are gradually forced outward until they tumble down by gravity, and thus slopes of angular pieces are accumulated along the steep sides of these ridges. In some cases this *talus* of fragments extends to the very top of the ledge, and the process can proceed no further. Yet when the ridge has a few hundred feet elevation, it is still going on, and that rapidly; every such ledge showing tons of fragments that have been yearly detached. Now this process must have commenced at least as early as the close of the diluvial epoch; and if that period was as remote as this hypothesis requires, we cannot but feel that ere this time it must have been completed; so that no ledges would remain to be crumbled down. If the hypothesis required only some ten thousand years, we might not be sure that the work would be yet completed; but when it demands ten times ten thousand at least, we can hardly doubt but long ere this, it must have been consummated.

Once more; we inquire, where is the evidence that whole continents have been raised up in this slow and insensible manner? Even to this hour, we possess only a few examples of the partial elevation of limited districts, by the agency of earthquakes, and a correspon-

dent depression of other places. But to raise up a whole continent in this manner, thousands of feet, is quite a different matter. The inclined position of the strata in different mountain chains, on the same continent, and other connected circumstances, show that they were elevated at various periods; and such elevations are sufficient to account for the rise of the whole continent. Is it not, then, gratuitous, to bring in the hypothesis of an extremely slow and general elevation, sustained as it is only by a few not well settled facts respecting Sweden and the coast of Chili, when we do not need it to explain the phenomena?

We have seen in a former number of this work* that a theory has lately been advanced by the President of the London Geological Society to explain the phenomena of travelled bowlders, without supposing any agency more powerful than is now in operation. It supposes those countries, where these bowlders occur, to have been formerly the bed of the ocean; and that icebergs from the northern regions, with these masses of rock attached to them, have floated southerly; and as they melted or struck against elevations at the bottom of the sea, the bowlders were detached and fell down. Afterwards, the bed of the ocean was gradually filled up, and these bowlders are now found at a great distance from their original beds, and give rise to the idea that some powerful agency has operated in former times to remove them. Now however well this theory may explain the phenomena of travelled bowlders in Great Britain, we find not a little difficulty in making it apply satisfactorily to this country. We do not doubt but when this continent was beneath the ocean, not a few bowlders might have been thus transported in icebergs by oceanic currents. But the problem to be solved requires that we take into consideration the *tout ensemble* of diluvial action as it is presented on this continent.

Any theory on this subject which will be satisfactory, must take into the account the four following points;

* Students' Cabinet Library of Useful Tracts, No. XXIX.

1. Erratic bowlders: 2. Diluvium: 3. Diluvial grooves and valleys: 4. Diluvial elevations and depressions. Our difficulty with the hypothesis under consideration, is, that the cause is inadequate to the observed effects.

In the first place, the extreme antiquity of diluvial agency, on this supposition, does not accord with the comparative recentness of the observed phenomena. Even if we admit that the diluvial phenomena, which we now witness, were the result of the latest action of oceanic currents and icebergs, before the elevation of the land, the time when that action took place must have been immensely remote; and judging from the perceptible progress which we see in a few years towards the degradation of mountains, the filling up of valleys, the disintegration of bowlders, and the obliteration of grooves on the rocks, we cannot reckon the period, that has elapsed since the commencement of these processes, by hundreds of thousands of years; although this is necessary, as we have attempted to show, to satisfy the hypothesis. Secondly, although icebergs may have transported large bowlders in some instances, yet it is difficult to conceive how they could have removed such immense accumulations of diluvial sand and gravel as are spread over the surface. We have sometimes put the inquiry, what would be the thickness of diluvium in New England, if spread uniformly over the surface? and though it is most difficult to arrive at any accurate estimate, we have no fears in saying, that it could not be less than ten, and probably would be twenty feet thick. And much of this has been transported from a distance of several miles. Surely, if all this work was accomplished by icebergs, millions of years would have been requisite. But if millions of years were employed, the disintegration of the transported masses must long ago have reduced them to fine soil. Besides, if our continent was slowly raised up as a whole, without change of relative levels, we are unable to conceive how the diluvium could have been brought over the whole surface, as we find it, unless the icebergs were detached from some other continent already above the waters. In

short, the cause seems to us entirely inadequate to the effects. Thirdly, the climate of New England, and of most other parts of the world where diluvial phenomena are very striking, is too warm for the formation of icebergs. And if they have transported diluvium, they must have been formed at the places whence diluvium has been derived—for this deposite is usually most abundant nearest to the rock whence it proceeded. As to a change of climate, we should suppose that as the land was gradually raised higher and higher above the ocean, the change would be from warmer to colder instead of the reverse, as this hypothesis requires. If any suppose these icebergs might have been formed during the winter, upon our coasts and rivers, we ask whether any such occurrences do now take place in such a manner as could possibly produce the phenomena of diluvium, even in the longest period; and especially, how could it take place while yet, by the supposition, our continent was beneath the waters? Fourthly, there is an erosion of the solid surface of the earth, corresponding to the passage over it of the bowlders and diluvium now deposited upon it. These grooves, scratches, and valleys, we have fully described, and they are precisely such effects as we should expect from urging over the surface by water, large bowlders and masses of diluvium. But if icebergs lift up sand, gravel, and large fragments, they would produce no erosion of the surface, until they should happen to strike against an elevation in their passage. And even then, the erosive action must be very slight, if the currents moved no faster than those which now exist in the ocean. These do not ordinarily move more than two or three miles per hour. But no one, it seems to us, can become well acquainted with diluvial phenomena, without a thorough conviction that they were the result of currents vastly more powerful than this. Nor can this hypothesis of icebergs explain why diluvial furrows are very common in valleys as well as on mountains. Fifthly, if our diluvium was produced by icebergs, in the manner supposed by this hypothesis, it is difficult to see why it contains almost no

organic relics. If for so many thousands of years our continent was at the bottom of the ocean, while this deposite was forming, and at a period too, when we know the ocean must have abounded with animals and plants, why were not some of them entombed? But if diluvium was the result of the powerful sweeping of the northern ocean over land long before elevated, we can conceive how there should be such a paucity of organized beings in diluvium; and also why most of those that it does contain in this and other countries, (such as the mammoth, elephant, megatherium, &c.) are mostly terrestrial. Finally, on this hypothesis diluvium ought to be found most abundantly on the tops of hills and mountains; whereas the greatest accumulation of this sort are on moderately elevated ground, and especially in the vicinity of mountain gorges; where we sometimes meet with astonishing examples of diluvial elevations and depressions.

These facts, to which many more might be added, we see not how to reconcile with the hypothesis of icebergs. We are willing to admit this, or any other explanation of diluvial phenomena, which has fewer difficulties than the supposition of a general deluge since the earth assumed essentially its present form and levels. For we freely admit that there are great difficulties in this latter theory. The greatest is, to conceive how running water could transport such quantities of sand and bowlders so far, and even up the face of somewhat steep acclivities. Even after we have called in the aid of icebergs, as we believe we must do if we admit such a deluge, we feel as if there was a considerable degree of inadequacy between the causes and their effects. All we can do in such a case is, either to adopt that hypothesis which seems encumbered with the fewest difficulties, or to let the judgment remain in suspense respecting them all, until farther light be elicited by more accurate and extended research. We have now furnished our readers with the means of judging which of these courses to adopt; and if they perceive us inclined to the diluvial hypothesis, they will know that it is not be-

cause we are free from doubts respecting its truth, but only because it seems to us more probable than any other.

PART III.

There is one other branch of the argument for a deluge from diluvial phenomena, which we must not pass in entire silence. It is derived from an examination of the contents of certain caverns and fissures. We can, however, give but a very brief view of it; although, to make it well understood, requires a volume. And happily that volume has been written. We refer to Dr. Buckland's *Reliquiae Diluvianae.**

* In a former Part, we expressed doubts as to what were the real opinions of Dr. Buckland at present respecting the geological evidence of a deluge; or rather, how far his opinions, as given in his Reliquiae, had been modified. On receiving his Bridgewater Treatise, we found that he had not abandoned the opinion that there has been a recent inundation of the earth, as shown by geology: but he doubts whether its identity with the Noachian deluge can be made out. The following are his views—"The evidence which I have collected in my Reliquiae Diluvianae, 1823, shows that one of the last great physical events that have affected the surface of our globe was a violent inundation which overwhelmed a great part of the northern hemisphere, and that this event was followed by the sudden disappearance of a larger number of the species of terrestrial quadrupeds which had inhabited these regions in the period immediately preceding it. I also ventured to apply the name *Diluvium*, to the superficial beds of gravel, clay and sand which appear to have been produced by this great irruption of water. The description of the facts that form the evidence presented in this volume, is kept distinct from the question of the identity of the event attested by them, with any deluge recorded in history. Discoveries which have been made, since the publication of this work, show that many of the animals therein described, existed during more than one geological period preceding the catastrophe by which they were extirpated. Hence it seems more probable, that the event in question was the last of the many geological revolutions that have been produced by violent irruptions of water, rather than the comparatively tranquil inundation described in the Inspired Narrative. It has been justly argued, against the attempt to

In 1821, the attention of Dr. Buckland was called to the contents of a cavern in limestone, in Yorkshire, that had recently been opened and found to contain numerous peculiar bones. He found this cavern to contain on its floor the following substances. At the bottom was a coating of stalagmite, or concreted limestone, that had dripped from the roof; then succeeded a layer of mud, which contained, as did also the stalagmite beneath it, numerous fragments of the bones of animals, most of them extinct. Above the mud was a second layer of stalagmite, destitute of bones; and the cavern appeared to have been closed since the period when the mud was introduced; the lower stalagmite having been deposited previous to that time, and the upper stalagmite subsequently. More than twenty species of animals were made out from these relics; and they were mostly tropical animals. From all the facts in the case, which were examined with great care by Prof. Buckland, he made several very important inferences: First, that this cave for a long time previous to the bringing in of the layer of mud, was the abode of hyenas, which dragged in thitlfer the bones of other animals for their food. Secondly, that the mud was introduced by some general flood, and not by local inundations. Thirdly, that since the introduction of the mud, a considerably long period must have elapsed during which the upper layer of stalagmite was formed. Fourthly, that numerous tropical animals inhabited Eng-

identify these two great historical and natural phenomena, that as the rise and fall of the waters of the Mosaic deluge are described to have been gradual, and of short duration, they would have produced comparatively little change on the surface of the country they overflowed. The large preponderance of extinct species among the animals we find in caves, and in superficial deposits of diluvium, and the new discovery of human bones along with them, afford other strong reasons for referring these species to a period anterior to the creation of man. This important point however cannot be considered as completely settled, till more detailed investigations of the newest members of the Pliocene, and of the diluvial and alluvial formations shall have taken place."—*Bridgewater Treatise*, p. 94, *Note*. *London*, 1836.

land at the period immediately preceding this inundation. Fifthly, that these became extinct at that time. By examining other similar caves and fissures in England and on the continent, he was able to add, Sixthly, that the period of the introduction of the mud corresponded with the epoch at which diluvium was deposited all over the world; and, Seventhly, that man did not probably exist in Europe previous to that period; since none of his remains have been found there in diluvium; though more recently some of the French geologists have maintained that human remains occur in such circumstances as to indicate that man must have been contemporary with elephants, hyenas, &c. But Dr. Buckland, in his recent Bridgewater Treatise, still maintains that "no conclusion is more fully established than the important fact of the total absence of any vestiges of the human species throughout the entire series of geological formations."* Finally, it was inferred from the facts respecting the caverns and fissures, that the sea and land did not change places at the last deluge; that is, the antediluvian continents did not then sink down, and the post-diluvian continents rise, as has been frequently imagined.

These conclusions, we are aware, have been assailed from all quarters: and we observe that not many geological writers seem now disposed to admit them in their full extent. Perhaps, indeed, Dr. Buckland made some inferences which the facts, more thoroughly understood, will not justify. And he also attempted to identify the deluge that filled the caverns and fissures with that of Noah; a point which he has himself since abandoned. But viewing the facts as indicative of a deluge, and not of the Mosaic deluge, we have never seen any refutation of the general conclusions that we have stated above. Indeed they correspond well with similar facts taught by other parts of geology, and a presumption is thereby created in favour of their truth. Taken independently of the other phenomena of diluvi-

* Bridgewater Treatise, Vol. I. p. 103. London, 1836.

um, which we have detailed, we doubt whether this antediluvian charnel house could have given us so clear an insight into the early history of our globe. Nor has Dr. Buckland attempted to separate the two classes of phenomena; and until we meet with stronger objections than any we have yet seen, we must regard his history of the contents of caves and fissures as an interesting branch of diluvial agency on the globe.

We have thus endeavoured to present a somewhat extended view of the argument furnished by geology, and derived chiefly from our own country in proof of an extensive, if not universal deluge, in comparatively modern times. We freely confess that we cannot explain the phenomena in any other way, than by admitting the occurrence of such a catastrophe. But we have no disposition to be dogmatical on the subject; and we have endeavoured to show that the denial of any such deluge does not bring us at all into collision with the inspired history. But admitting such a deluge, is it, or is it not, identical with that described by Moses? On this point we shall be still less disposed to dogmatize. Yet we will present our readers with the arguments in favour of their identity, as well as with those opposed to it.

In the first place, the deluges of geology and of Scripture agree in being comparatively recent. We know the date of the latter; but though geology has left on imperishable monuments the traces of many distinct epochs, it tells us of few chronological dates. Hence we can only compare the diluvial epoch with those that preceded it. And with the exception of the modern epoch, that is the commencement of the deposition of alluvium, the time when diluvium was deposited was the last of these epochs. It might indeed have been earlier than the date of Noah's deluge: yet we have in another place presented arguments to prove that it could not have been excessively remote. And until it can be proved that it was more remote than the flood described by Moses, why should he give it a gratuitous antiquity that we might not identify it with the latter?

True philosophy, it seems to us, ought to regard them as synchronous until very strong evidence be presented to the contrary.

Secondly, the two deluges agree together in being of great extent. We do not say, in being universal, because it may be doubted and often has been, in regard to each of them, whether they were so. We think we have shown that the geological deluge extended over a large part of the northern hemisphere: but the tropical and southern parts of the globe have not had their diluvial phenomena examined with care enough to enable us to decide whether this deluge extended so far. Yet from the powerful waves produced at a great distance by earthquakes beneath the ocean, it is difficult to conceive how a torrent of water should rush over the northern hemisphere, or even over the northern parts of America, without inundating by its direct or reflex action all other parts of the globe. We prefer, however, to speak of the last geological deluge as being extensive, rather than universal, until direct evidence be furnished of its being co-extensive with the globe.

As to the extent of the Noachian deluge, the language of Scripture seems at first view to be very decided: *And the waters prevailed exceedingly upon the earth; and all the high hills that were under the whole heaven were covered.* Alike universal are the terms employed repeatedly to denote the destruction of animals upon the earth: *And behold I, even I, do bring a flood of waters upon the earth, to destroy all flesh, wherein is the breath of life, from under heaven; and every thing that is in the earth shall die.* In spite of these strong expressions, not a few able writers have understood them as simply universal terms with a limited meaning. Of such cases numerous examples might be quoted in the sacred records. Thus, in Gen. xli. 57, it is said, that *all countries came into Egypt to Joseph to buy corn, because that the famine was sore in all lands.* Here we have reason to suppose that only the well known countries around Egypt are meant. Again, 1 Kings x. 24; *And all the earth sought to Solomon to*

hear his wisdom: that is, doubtless, his fame was very extensive, and many sought to him, but not literally the whole earth. We have also a case in point in Deut. ii. 25; *This day I will begin to put the dread of thee and the fear of thee upon the nations that are under the whole heavens, who shall hear report of thee, and shall tremble, and be in anguish because of thee.* An analogous case is that of the animals shown to Peter in vision, let down in "a certain vessel," *wherein were all manner of four-footed beasts of the earth, and wild beasts and creeping things, and fowls of the air,* (Acts x. 12.) Who will imagine that all the quadrupeds, reptiles, and birds on the globe, were here shown to the apostle? Is it not clear that this is an example of the principle stated by Aristotle: τὸ γὰρ πάντες ἀντὶ πολλοὶ κατὰ μεταφορὰν εἴρηται, "*all* is said metaphorically for *many*?" We might quote here the declaration of Paul to the Colossians (Col. i. 23,) wherein he speaks of the *Gospel which was preached to every creature which is under heaven.* No one can suppose that the apostle meant that the Gospel had in that day been literally preached to every creature under heaven: for every reader must have known the contrary to be true. But it had been preached very extensively; and thus would every reader understand it; so conformable was the mode of expression to the idiom of the Bible, and indeed of all languages. "The Jews," says Michaelis, "have well observed, that כֹּל, *all, every,* is not to be understood, on all occasions, with the mathematical sense of *all;* because it is also used to signify many." The same is true of the Greek πᾶς, the Latin *omnis,* the English *all,* &c. Even in the description of the flood in Genesis there is one of these universal terms employed, whose meaning we are obliged to limit. It was commanded to Noah—*of every living thing of all flesh, pairs of every sort, shalt thou bring into the ark to keep them alive.* Here we must limit the term *all flesh,* to such animals as needed a shelter from the cataclysm. Most writers on the Scriptures are now willing to admit that not even pairs of all the land animals, amounting, it is now

well known, to several hundred thousand, were collected from every part of the earth into the ark. Even Granville Penn, in his severe strictures upon geology, as he understands it, or rather as he misunderstands it, takes this ground. But the younger Rosenmüller very justly contends, that if the universality in respect to the animals saved in the ark be given up, so must the universality in respect to its extent: that is, if we may limit the terms in the one case, we may in the other.

Such has been the conclusion of many able commentators. "It is evident," says Bishop Stillingfleet, "that the flood was universal as to mankind; but from thence follows no necessity at all of asserting the universality of it as to the globe of the earth, unless it be sufficiently proved that the whole earth was peopled before the flood." (Orig. Sacr. Book 3. chap. 4.) "Consentiunt quidem omnes," says Le Clerc, "diluvium universale fuisse, quatenus totum orbem habitatum oppressit, universumque humanum genus, exemptâ Noachi familiâ, eo interiit. At alii volunt totum telluris globum aquis obrutum fuisse, quod alii negant." "Non putandum est," says Poole in his Synopsis, "totum terrae globum aquis tectum fuisse. Quid opus erat illas mergere terras, ubi homines non erant? Licet ergo credamus ne centissimam quidem orbis partem aquis fuisse obrutam, erit nihilominus diluvium universale, quia clades totum orbem oppressit." "Num diluvium totum terrarum orbem inundavit," says Dathe, "an regiones tantum eo tempore habitatas dissentiunt interpretes. Ego quidem facio cum his, qui posterioram sententiam defendunt—Vocabulum omnis, non probat inundationem fuisse universalem. Constet multis in locis כֹּל intelligendum esse tantum de re, sive loco de quo agitur, Cap. ii. 19, 20. Ezek. xxxi. 6. Igitur *omnia animalia*, in navem intromissa sunt earum regionum, quae aquis inundandae. Sic quoque de *montibus* sentiendum est, quos aquae superaverunt."*

We doubt, therefore, whether the language of Moses

* Pentateuchus a Dathio, p. 63.

requires us to admit that he meant to impute an universality to the deluge co-extensive with the earth. But if it be a fact that the ark did rest upon the summit of the present mount Ararat, in Armenia, and that the waters rose fifteen cubits above that level, we can hardly conceive it possible that so mighty a wave should not sweep over the whole globe, either in its flux or reflux. For, according to the recent observations of Professor Parrot, that mountain is 15,219 English feet above the ocean. There are two suggestions, however, that may throw some doubt over this conclusion. Some authors do not think it certain that the present mount Ararat is the Ararat (אֲרָרָט) on which the ark rested. "The stream of interpreters," says Mr. Kirby, "ancient and modern, place this mountain in Armenia; but Shuckford, after Sir Walter Raleigh, seems to think that Ararat was further to the east and belonged to the great range anciently called Caucasus and Imaus, which terminates in the Himmaleh mountains to the north of India. This opinion seems to receive some confirmation from Scripture, for it is said, *as they journeyed from the east, they found a plain in the land of Shinar*. Now the Armenian Ararat is to the *north* of Babylonia, whereas the Indian is to the east."* Mr. Kirby quotes also the tradition prevalent in India that the ark was moored at first to the Himmaleh, and he considers its superior height as corresponding better than that of Ararat with the long period of ten weeks that intervened after the ark first rested, before the tops of other mountains were seen. These arguments are not perhaps sufficient to overweigh the almost universal testimony of antiquity; yet they are not without weight. We venture to make another suggestion. Is it certain that the ark rested upon the highest summit of Ararat? The language of Moses does not surely teach that such was the fact; for he merely states that the ark rested upon the mountains of Ararat, or Armenia (עַל הָרֵי אֲרָרָט, Gen. viii. 4). And we might presume that the place

* Bridgewater Treatise, p. 25. Philad. 1836.

of descent would be chosen by God in a convenient spot for reaching the plain below; whereas the summit of Ararat is so difficult of ascent, that not until A.D. 1829, did man succeed in setting his foot upon it. So that nothing but a miracle could have enabled the men and animals preserved in the ark to descend in safety. We confess that the point where the ark rested must have been very elevated, because we find it to have been ten weeks afterwards before the tops of other mountains began to appear, although the waters were continually decreasing.

If we mistake not, then, the deluges of Scripture and of geology, may, or may not, have been universal, in consistency with the language of the sacred history, and with the facts of science as they are at present understood. They agree, therefore, in having been very extensive, if not universal. And in view of such proofs of their identity, it should require decisive evidence to the contrary to disjoin them. The following are the principal objections to this identity.

1. The great preponderance of extinct species of organic beings in diluvium. Some of these species appear to have existed through several geological periods anterior to the diluvial epoch. Now it is known that the more unlike existing animals and plants are to the remains of those in a particular formation, the more ancient do we conclude that formation to be. On the same principle, the presumption is rather in favour of placing the last aqueous catastrophe which geology describes at a period earlier than man's creation.

2. No human remains are found in diluvium. If man had existed and in great numbers, there seems no reason why his remains should not occur along with those of other animals. There is no way to avoid this conclusion but by supposing the antediluvians to have been limited to central Asia, whose diluvium has been as yet little explored.

3. The period occupied by the Mosaic deluge was too short to have produced the diluvial phenomena which geology exhibits. We confess we have been

deeply impressed with this objection, when witnessing the powerful denuding effects of the last geological cataclysm. It is not merely the vast accumulations of diluvium, nor the smoothed and furrowed aspect of the hardest rocks, that have seemed to demand more time than the year of the Noachian deluge; but the scooping out of vallies, and that too of considerable depth, and in solid rock. True, there are distinct marks of a power and violence in the diluvian waters of which we see no examples at present in aqueous currents; and we feel at a loss to determine how much more rapidly this unknown increase of power might have accomplished the work of denudation. We ought to recollect too, that when we look upon a valley through which a powerful current of water has rushed, we are not generally able to determine whether that current has formed the whole valley, or only given it its last form. Another circumstance, also, has struck us as indicating that even the geological deluge did not occupy an immense period Along the rocky banks of existing rivers, we have almost always found more or less of those excavations in the rocks called *pot holes*, produced by the long continued gyratory motion of pebbles in a cavity. But distinct as are the marks of the diluvial waters, we never saw any of these peculiar excavations. And we cannot but impute their non-existence to the want of sufficient time during the cataclysm.

Upon the whole, the arguments against the identity of the two deluges appear to us rather to preponderate. "This important point, however," to use the language of Dr. Buckland, "cannot be considered as completely settled, till more detailed investigations of the newest members of the Pliocene, and of the diluvial and alluvial formations shall have taken place."* We feel no great anxiety how this question is settled, as to its bearing upon revelation. But examined in the true spirit of the Baconian philosophy, it seems to us that there is quite too much evidence of the identity of the

* Bridgewater Treatise, p. 95. Vol. I. London, 1836.

two deluges, and quite too much ignorance of the whole subject of diluvium yet remaining, to permit an impartial geologist to decide peremptorily, as some have done, that they could not have been contemporaneous. We rather prefer that state of mind in which the judgment remains undecided, waiting for further light. Meanwhile it is sufficient, so far as revelation is concerned, to have shown that no presumption is derived from geology against the truth of Moses's history of the deluge; but rather a presumption in its favour even on the most unfavourable supposition.

3. *We now proceed, as the third general branch of our subject, to consider the most important objections derived from geology and natural history, against the truth of the Mosaic history of the deluge.*

Not many years since, it was thought by the sceptical, that civil history furnished many facts inconsistent with the recent date of the Noachian deluge. The archives and traditions of Assyria, Egypt, and China, the Hindoo astronomical tables, and the Zodiacs of Denderah and Esneh, were mustered for battle with the Bible. The shout of victory, on the part of infidelity, rung loudly before the tug of the war had come. And it was not so much Christians who stood up in defence of the Bible, as it was men, who with little regard for the Scriptures, were yet friends to fair examination. Before the magic scrutiny of such minds, the hoary aspect of these vaunted relics disappeared, and strong confirmation of the Mosaic chronology was the result. So that it is no longer necessary to go into a laboured refutation of the extravagant chronologies of semi-barbarous nations, nor of their supposititious astronomical epochs.* Many of the objections to the Mosaic chronology, derived from science, also, now that the subjects are better understood, have ceased to be adduced by intelligent infidels; but we must briefly refer to some,

*. By far the best view of these subjects which we have seen is contained in the interesting Lectures of Dr. Wiseman on the Connection between Science and Revelation, recently republished at Andover.

which, by those not thoroughly acquainted with science, are still occasionally adduced in opposition to the authority of Moses.

1. It has been thought that certain natural processes now going on, must have had an earlier commencement than the date of the Noachian deluge.

It is hardly necessary here to refer to the seven lava beds, said to exist around Mount Etna, with a rich stratum of soil, or decomposed lava, between each of them; and each of which, it was supposed, must have demanded at least 2000 years for its formation and decomposition. For it now appears that the supposed decomposed surface is nothing but a ferruginous tufa, which is often produced at the beginning or end of a volcanic eruption; and, therefore, these successive beds of lava might have been produced in as many years.

The gorge or ravine, 200 feet deep and seven miles long, between Niagara Falls and Lake Ontario, has long been thought to require an immense period for its excavation; at least 10,000 years. Admitting this to be true, we do not see how it clashes with the chronology of Moses, according to the view which most Christian geologists take of the creation of the world. For why may not that excavation have commenced anterior to the deluge; nay, before the six days of creation? Nearly all real geologists now believe that our continents remain essentially the same as they were before the deluge; so that antediluvian processes of excavation might have been resumed in the postdiluvian period. But there is another and probably a better mode of meeting this difficulty. Prof. Rogers, as we have seen, (p. 101,) supposes that the trough below the falls may have been commenced by diluvial agency; and that the waters of the lake have only modified it, and are slowly extending it southerly. The fact that this trough lies in a north and south direction favours this suggestion, made as it is by a cautious and able geologist; and whoever is familiar with diluvial phenomena, will see at once that it is extremely probable.

According to this theory all calculations made from the present rate of retrocession of the falls, will give us no correct results as to the time when the process began, because we do not know at what point the abrading process began.

2. Another objection formerly urged with confidence, is, that it is mathematically impossible for the present oceans of the globe to be raised so as to cover its whole surface. This would require several additional oceans to be superimposed upon those now existing; and from whence could this immense additional quantity of water have proceeded; or if miraculously obtained, what has become of it?

Some have replied, by considering the whole phenomena of the flood as miraculous. And a perusal of the scriptural narrative is apt to leave the impression on the mind that such was the case. But according to the present state of geological science, there is no need of resorting to a miracle to escape from this objection. For in the first place, we have endeavoured to show that there is nothing in the Scripture account of the deluge that requires us to consider it universal, except so far as man dwelt on the globe. But secondly, the sudden elevation of a continent, or mountain chain, would raise such a wave, as in its flux and reflux, must overwhelm all the dry land, although all continents might not be submerged at the same moment. We have sometimes been almost disposed to believe that this flux and reflux of the diluvian waters is referred to in the הָלוֹךְ וְשׁוֹב of Gen. viii. 3, and the הָלוֹךְ וְחָסוֹר of Gen. viii. 5, *(literally, in going and returning and in going and decreasing)* but we suppose that the Hebrew idiom will not allow that any thing more is included in these phrases than *a continual decrease of the waters.*

3. Some parts of the globe, it is said, exhibit no marks of diluvial agency. Chaubard, as already stated, (p. 106,) declares that erratic blocks or bowlders are wanting in the Pyrenees, the Appenines, the Carpathian mountains, and the mountains of Bohemia; and Mr. Lyell states that he did not find them in

Sicily, nor in Italy, till he approached the foot of the Alps. Humboldt states, also, that there are no such fragments at the eastern foot of the equatorial Andes.* Mr. Lyell likewise represents the cones of extinct volcanoes in central France as showing no marks of erosion by water.† These facts are not, however, adduced by these writers to disprove the occurrence of such a flood as Moses describes; but some of them at least suppose that they show that catastrophe to have been local, not universal; or that it was too quiet to leave any permanent traces of its existence. And if we admit that the Noachian deluge was not universal, as we have endeavoured to show may be done consistently with the terms of the sacred record, these statements are no objection to that history. But we may be permitted to doubt whether they throw any formidable difficulty in the way of one who contends for the universality and powerful action of the Mosaic deluge. For it is very certain that the force of diluvial currents was greatly modified by local circumstances, having been most powerful in mountainous regions, or where the waters were forced through narrow gorges. Hence it is easy to conceive, that in some regions those currents might have been so feeble, as for instance on extensive plains, as to leave few or no traces. And as to the volcanic cones of central France, is it certain that they may not have been thrown up since the time of Noah's flood? For the earliest historical records respecting that country, do not reach back within 2000 years of that event. Or if they were antediluvian, is it certain that the diluvial currents might not have been comparatively feeble in that region?

4. The existence and preservation of the olive on mount Ararat have been regarded as other objections against the Mosaic account of the deluge. It does not now grow, it is said, in the vicinity of that mountain, certainly not near its top, which is covered with perpe-

* Lyell's Anniversary Address before the London Geol. Society, 1836, p. 32.

† Lyell's Geology, Vol. 3. p. 273.

tual snow. It might be a sufficient reply to this difficulty, that there has been in all ages not a little diversity of opinion as to the situation of the Ararat on which the ark rested. If the opinion should prove true, that it is really a part of the Himmaleh range in India, the objection would disappear. But not to resort to this mode of avoiding the difficulty, if we regard the sacred and geological deluges as identical, we have the strongest reason to suppose that at the time of the latter, there was no small change of the temperature of northern regions. All the northern part of Asia abounds with the remains of the elephant. It is true that one of these animals, found preserved entire in ice, was covered with hair; and some have thought that this circumstance proves the animal to have been an inhabitant of a cold climate. But if it inhabited a climate as cold as the one now existing there, whence could it obtain vegetable food? The truth is, that hairy elephants are now found in the higher and cooler parts of India; and this shows us, that though the climate of Siberia when inhabited by these extinct races of elephants was colder than the present unmodified climate of the torrid zone, yet it was not much colder. And hence the antediluvian climate around the present Ararat, might have been warm enough to have produced the olive. Indeed, for this purpose very little change was probably necessary; we mean in the lower parts of Armenia; since Strabo mentions that in his day one part of that country did actually produce the olive.

That a change of climate did take place at the epoch of the geological deluge, is proved very conclusively from the fact above referred to, of the discovery of an entire elephant encased in ice on the shores of the Arctic Ocean. For previous to the time in which he was enveloped in the ice, the climate must have been too warm, in order that such an animal might live, to suppose he was frozen up during the winter so firmly as not to thaw out again during the summer. But the congelation, when it took place, was so powerful that the ice remained unmelted till the beginning of the present century.

The change of climate, therefore, must have been sudden and permanent. Whether the pouring down of the contents of the Arctic Ocean upon that country might have been a sufficient cause of this change, we hardly feel prepared to say. That it would produce as great a change of temperature as we suppose took place, for the time being, we doubt not. We find it difficult, however, to conceive that this cause should still continue in operation. On the whole, beset as the subject is with difficulties, we are prepared to say little more than that a change of climate did take place at the epoch of the last geological deluge; and if the deluge of Scripture be identical, this fact removes all difficulty respecting the growth of the olive in Armenia. Or, if they be not identical, what happened at one of these cataclysms, may have been repeated during the other.

It appears that during the Noachian deluge the olive tree from which the dove obtained a leaf, was neither uprooted, nor did it lose its vitality. Hence some have inferred that there could not have been much violence in the diluvian waters. But we have only to suppose that particular tree to have stood in a sheltered situation, and it might have remained unaffected though the waters raged with great fury around it. As to the "leaf plucked off," it might have been put forth after the waters had subsided; for there was an interval of more than a month and a half between the time when the ark first grounded, and when the dove was sent forth the second time. Some have supposed the olive to have been a new creation, of which we have reason to suppose there may have been many examples immediately subsequent to the deluge. But in that case, the leaf could hardly have been evidence to Noah that the earth had become so dry that vegetation had again put forth. Nor do we see any need of miraculous agency in the case, and therefore we ought not to admit it without strong proof.

5. Another objection to the Mosaic account of the deluge is, that pairs of all the animals on the globe

could not have been preserved in the ark. From the days of Celsus, who in reference to this difficulty denominated the ark κιβωτὸν ἀλλόκοτον, *the absurd ark*, to the present time, this objection has been urged as quite unanswerable. And many theologians have made great efforts to show, by rigid calculation, that there was room abundant in that vessel for all the animals that would be liable to be destroyed by a deluge, with provisions for a year. If we regard the cubit as having been 21.8 inches, according to some writers, the length of the ark was 547 English feet, its breadth ninety-one feet, and its height fifty-five feet. But if the cubit was only a foot and a half, according to the most probable estimate, its length was 450 feet, its breadth seventy-five feet, and its height forty-five feet. Now such dimensions would perhaps be sufficient to accommodate pairs of all the animals known to naturalists in the days of Buffon; when they estimated the number of the mammalia at about 250, and made little account of other animals. But since more than a thousand quadrupeds have been described, more than 6000 birds, and more than 100,000 insects; and since it is made probable that the actual number of these classes is at least half a million;* such calculations as these have fallen into neglect, and no judicious Christian likes to rest the authority of Moses upon such uncertain estimates, if there be another mode of meeting this difficulty less objectionable. And another mode is now generally adopted, even by writers who are extremely fearful lest any violence should be done to the language of Scripture, to accommodate it to the discoveries of science. They suppose it, as we have already mentioned in considering the question as to the universality of the flood, an example where universal terms are used with a limited signification. For the command to bring into the ark *of every living thing of all flesh, pairs of every sort*, must, at any rate, be limited to those animals that live out of water; and there would seem to be no reason why a still further limita-

* Foreign Quarterly Review for April, 1835, p. 90.

tion of the language is not allowable if there be sufficient reason for it. Now we cannot but believe that the impossibility, without a constant miracle, of collecting and preserving all animals from every part of the world in the ark, as well as the entire uselessness of doing this, so far as we can see, together with the difficulties resulting from the facts concerning their present distribution over the earth, (a subject which we shall shortly consider,) do form a sufficient reason for limiting the language of Moses to those animals most common and important in the country where the ark was constructed; or rather to a sufficient number of animals to form an impressive memorial to the post-diluvians of so great a catastrophe, and probably also to furnish them at once, without a miracle, with the necessary domestic animals. The case seems very analogous to the naming of animals by Adam, when it is said that *Adam gave names to all cattle and to the fowl of the air.* But few commentators, we believe, will contend that this is to be understood as zoölogically true. We are not prepared to say that the ark might not have been large enough to have contained pairs of all the animals that live out of water; but to collect them and take care of them, and afterwards to distribute them over the face of the earth, must have been altogether miraculous; and as we do not see of what use such a miracle could have been, and we know that God does not put forth a miraculous agency where the object can be accomplished by his ordinary operations, we rather prefer the explanation that supposes universal terms to have been employed with a limited meaning; and that only a part of the species of animals that then existed were preserved in the ark. As we do not thus violate the principles of interpretation, and as this exegesis perfectly satisfies the objection, it seems to us more satisfactory than any other.

6. Finally, it is said that the present distribution of animals on the globe is incompatible with the idea that they ever spread or migrated from any one point on its surface, as they must have done if all proceeded from

those preserved in the ark. This is the most important and plausible objection we have considered; and in order fully to appreciate its force, we must date the general principles by which the distribution of plants and animals on the globe has been regulated; a subject which, until recently, even the ablest naturalists did not understand; and concerning which, we apprehend, that very vague notions now prevail among the great mass of intelligent men who are not naturalists.

In the first place, a considerable number of species, both of animals and plants, are capable of enduring great varieties of climate, and have in fact migrated over a considerable part of the globe. Most of the domestic animals, such as the ox, the horse, the dog, and the cat, are of this description; being found in every climate. But some, such as the camel and the elephant, are confined to the warmer parts of the earth. Some plants also accompany man wherever he goes. The plantain, for instance (Plantago major L.) followed the track of the first settlers of this country so uniformly, as to be denominated by Indians, "English man's foot." It is only a few years since the flea bane (Erigeron Canadense L.) was first carried to Europe, and it is now spread over France, Great Britain, Italy, Sicily, Holland, and Germany. The thorn apple (Datura Stramonium L.) originally brought from the East Indies and Abyssinia, now grows as a common weed over nearly every part of Europe and the United States. The seeds of some plants are fitted to sail on the water, and in this way are driven from continent to continent. Others have hooks attached to them, so that they may cling to the hairy coats of animals, and be thus dispersed.

To this migratory class of organized beings, man belongs. It is easy to conceive how he might have originated in a particular spot, and in the course of a few ages have been spread over the globe, as we now find him to be. We are not aware that any of those naturalists who believe the varieties of men to constitute different species, created in the regions they now occupy, deny at all the possibility of distribution from

one point; but they found their opinion upon other considerations.

But in the second place, the greater part of animals and plants are confined to particular districts of the globe; so that the earth is divided into a large number of distinct zoölogical and botanical provinces, each one of which is distinguished by several peculiar species. The most distinct of these provinces are separated by wide oceans, or are situated in different zones; but sometimes a range of mountains merely forms the dividing line. The difference between the plants and animals of the several zones on the globe, has long been well known; and it may be supposed that all the peculiarity of any particular zoölogical or botanical province depends upon the latitude. But this is not the fact; for the productions of countries on different continents, between the same isothermal lines, do not correspond; certainly not as to species. Thus of the 2891 species of plants described by Pursh in the United States, only 385 occur in the temperate parts of Europe. New Holland is remarkable for the peculiarity of its Fauna and Flora; the plants and animals found there being almost without exception different from those in other parts of the world. So the animals of America are strikingly different from those of the eastern continent. The number of zoölogical provinces on the globe has been estimated at eleven, and the Decandolles, father and son, than whom no better judges can be named, reckon the number of distinct botanical provinces at twenty-seven. This estimate was the result of an examination of seventy or eighty thousand species.

In the early days of natural history, travellers expected to find the same animals and plants in distant countries as in their own; and often they fancied resemblances where later observations have shown only a sort of family likeness, but not a specific identity. Even Linnaeus maintained that all the species of animals and plants were originally placed on one fertile spot, from whence they subsequently migrated, so as to fill the earth. But the facts of the case were then too imperfectly

known to enable even the strongest and most impartial mind to arrive at a correct conclusion. Naturalists now almost universally suppose that each species was indigenous to one particular spot, and that different species were placed in different spots, from whence they have spread to a greater or less distance. So that when they find a species on almost every part of the globe, they immediately begin to seek out its birth-place and the means of its dispersion.

From these facts we trust our readers will be able to estimate the force of the objection under consideration. If all animals on the face of the globe were destroyed by the deluge, except those preserved in the ark, then the existing races must have migrated from the region of Ararat to their present stations in the remotest parts of the globe. But facts show that with few exceptions they are confined to particular regions; and where we find the same animal in distant spots, we also find it in intermediate places. If all proceeded from one point after the deluge, we should have expected to find traces of their existence along the path of their migration. Again, if this dispersion took place naturally, how could species adapted, as we now see the greater part are, to a particular climate, have been sustained while they were gradually moving through regions unpropitious to them, to that spot for which Providence intended them? By what instinct could they have been guided to countries often several thousand miles distant? And especially, how could the tropical animals of America have reached their present abode, without passing through the Arctic regions around Behring's Strait, where such animals could not now survive a week? And there are many other cases where the difficulty of transportation must have been equally great.

To reconcile this objection with the history of Noah's deluge, as it is usually understood, is, indeed, no easy task; that is, if we suppose pairs of all animals on the globe were actually preserved in the ark and the deluge was strictly universal. Some, we know, will cut the knot at once, by imputing the whole to the miraculous

power of God—and we readily admit that this was sufficient if exerted—but we do not think it necessary to resort to such an agency in order to vindicate the Scriptures: and as a resort to miracles rarely satisfies, although it may silence sceptical minds, we shall suggest two hypotheses which we regard sufficient to meet the difficulty.

In the first place, the deluge may not have been universal. We have already endeavoured to show that the כָּל־הָאָרֶץ (Gen. viii. 9) over which the waters are said to have flowed, may have been equivalent to the *οἰκουμένη* of the New Testament; that is, the whole world so far as men inhabited it. And if this be admitted, the animals that existed in remote countries may not have perished; while those saved in the ark furnished the stock for repeopling the regions which the flood had destroyed. Such an interpretation has had its advocates, ever since the days of Quirini, in 1676; and we are confident that it may be maintained without straining or perverting the sacred record at all, though we feel some difficulty with it on geological grounds: that is, we can hardly see why a deluge extensive enough to overwhelm the *οἰκουμένη*, should not sweep over other parts of the world.

In the second place, a new creation of animals and plants may have taken place subsequent to the deluge. We admit that the Scriptures are silent on the subject, and therefore they leave us free to reason concerning it from philosophical considerations. If it be admitted that the language of Scripture respecting the deluge is to be limited to the region, probably not extensive, which was occupied by man, and to the animals with which he was most familiar in those regions, we should not expect, that in giving an account of what took place after the deluge, they would describe the animals and plants of other parts of the world, even if they were then first created: For in this case, it would have been necessary to communicate a knowledge of the geography of the globe; or in other words, to anticipate future discoveries in that science. And this would have been

foreign to the object of revelation, as indeed would any account be of the animals and plants of remote regions, or of organic remains in the rocks. It ought also to be recollected, that the sacred writers use almost the same language to describe the original creation of the matter of the universe, as the successive production of animals and plants by ordinary generation; since they looked upon both as equally the work of God. A passage in the 104th Psalm will illustrate this idea, (ver. 29, 30): *Thou hidest thy face, they* (animals of every kind) *are troubled: thou takest away their breath, they die and return to their dust. Thou sendest forth thy Spirit, they are created: and thou renewest the face of the earth.* Now we cannot but see the resemblance between this description and that of the original creation in Genesis. The same Spirit is concerned and the same word used, viz. בָּרָא. It very well describes, also, those successive destructions and renewals of animal races, which geologists maintain are shown by the history of organic remains, to have taken place on the globe. Yet commentators generally suppose that this passage describes only the ordinary destruction and renewal of the animal races, which is daily taking place by what are called natural laws.

The inference we wish to make from such facts as these, is, that even though new species of organized beings were from time to time created, it would not be strange that it should not be noticed in the Scriptures, if the mention of it did not fall in directly with the great moral object of the Bible; since the inspired writers would not regard such an exercise of Divine power as scarcely more illustrative of the perfections of Jehovah, than the ordinary and continual reproduction of animals and plants.

Suppose now, that naturalists should find reason to conclude that new species of animals and plants do occasionally appear on the globe; would there be any inconsistency between such a fact and the Scriptures? Must we believe that the creation of all animals and plants, that ever have existed, is described in the Bible?

We think it almost certain, as we have shown in another place, (Stud. Cab. Lib. of Useful Tracts, No. XIX, p. 70,) that the animals and plants found fossil are not described in Genesis. And naturalists think that there are some cases in which a new species of animal is introduced in modern times; as in those instances where animals or animalculae are found only in some substance that has been discovered by a chemical process in modern times.* We do not regard the examples which they cite as entirely satisfactory: but the enormous multiplication of the frogs of Egypt, sometimes mentioned by commentators as an example of a new creation, seems explicable by natural laws but with great difficulty. And such examples, in connection with our previous reasoning, go to take away all improbability from the conclusion, that there was a new creation immediately subsequent to the deluge.

Evidence is derived from geology that several catastrophes, which have in early times taken place on the globe, by which entire races of organized beings have been destroyed, have been followed by the creation of new races. Sometimes a few species seem to have survived the catastrophe, or have been reproduced; but in general, those created after the catastrophe have been different from those destroyed by it. Here then, it seems to us, we obtain a still stronger presumption that the diluvial catastrophe described by Moses was followed by an analogous new creation, so far as it was necessary to repeople the world, or to adapt organized beings to changes in climate and other circumstances. The numerous examples of new creations which Palaeontology furnishes, show us that such is the law of the Divine administration.

Another consideration renders still more probable the idea of a new creation subsequent to the deluge. It does not appear from the sacred records, that any provision was made in the ark for the preservation of plants or seeds. Now there are very many species that

* Blumenbach's Manual of Natural History, p. 276. London, 1825.

would have been entirely destroyed by being covered with water for a year; as will be evident to any one who has noticed how a flood of a few weeks will ruin many plants on which the water rests. They cannot survive so long without the access of air. The diluvial waters, therefore, must have destroyed the germinating principle in numerous instances; and unless the post-diluvian flora be more scanty than the antediluvian, as we have no reason to suppose,—these last species must have been recreated after the waters had retired.

These several circumstances do not prove certainly that such a creation did take place. But when we connect them with the facts that have been detailed, respecting the present distribution of organized beings, which are totally at variance with their having spread except miraculously from one point, and when we consider further, that the Scriptures leave us at entire liberty to suppose such a creation, the hypothesis certainly appears probable enough to form a satisfactory reply to the objection under consideration against the scriptural account derived from the present distribution of organized beings. Some, however, have thought that it would be still more satisfactory to combine both the hypotheses which we have named. They would admit a new creation, and also suppose that the deluge was not universal. We do not feel anxious which of these three modes of relieving the difficulty is adopted. But one of them at least seems to us indispensable.

4. *It only remains, as the fourth general branch of our subject, to inquire whether any natural causes could have produced the deluge.*

It is well known, that from the earliest times writers have indulged in speculations on the natural causes of this event; while to many, such an inquiry seems almost sacrilegious; since they suppose the deluge to have been strictly miraculous. Had the sacred writers distinctly informed us that such was the fact, all philosophical reasoning concerning that event would have been presumptuous and useless. But since the Bible is silent on this point, and since we know it to be

a general principle in God's government not to superadd to natural agencies a miraculous energy where the former is sufficient to accomplish his purposes, we are surely at liberty to inquire whether any forces exist in nature sufficient, by their unaided operation, to produce such a catastrophe. In giving a history of opinions respecting the deluge, we have exhibited a variety of hypotheses on this subject; but most of them are too evidently baseless to need a formal examination. We shall therefore mention only those that are still advanced by respectable writers of the present day.

1. Some impute the deluge to the approximation of a comet to the earth, or to an actual appulse of the two bodies. On this hypothesis it is not necessary to add any thing to what we have stated in giving the history of opinions concerning the deluge, (Stud. Cab. Lib. of Useful Tracts, No. XXXI.) The fact, now well ascertained, that the comets are not solid bodies, and for the most part are only very attenuated vapour, certainly renders this hypothesis entirely untenable. And we can explain the circumstance that some writers still cling to it, only by supposing them ignorant of the facts, or strangely perverted in their judgments by the influence of hypothesis.

2. Some suppose that the deluge was caused by the sinking down of the antediluvian continents beneath the ocean, and the elevation of our present continents above the waters. Such an event would, indeed, produce a complete and universal deluge; and a certain class of writers (see Students' Cabinet Library of Useful Tracts, No. XXXI.) maintain this theory with great confidence. They are writers who are greatly scandalized by the efforts of geologists to show that a long interval may have elapsed, undescribed, between the 'beginning' and the six days of creation, lest too great latitude of interpretation should thus be allowed in biblical exegesis. And yet this hypothesis of theirs requires them to admit, contrary to what every child sees to be the truth in reading the

Bible, that the waters of the flood did not first rise over the land and then subside, leaving the same land dry; but that the land sunk down, which brought over it the ocean, and that other continents rose in other parts of the globe to form new habitations for organized beings. Hence they must further admit, that there must at that time have been an entirely new creation of plants and many animals. Also, that the description of the garden of Eden in Genesis is not a part of the Bible, but an interpolation! Surely men who can take such liberties as this with the Bible, where its language is plain and simple, should be cautious in condemning others for a more liberal interpretation of some passages which have always perplexed the critic. And further, this supposed interchange of land and water at the epoch of the last deluge, is contrary to many facts in geology; such as, for instance, the occurrence of the remains of land animals on all existing continents, imbedded in the higher strata. Tertiary deposites also are frequent whose strata are horizontal, and whose level therefore cannot have been essentially altered since their deposition; for otherwise they would have been tilted up. Yet these deposites were made anterior to the last geological deluge, because its relics are strowed over them. But in giving a history of this subject, we have already entered so fully into the arguments respecting this hypothesis, that we forbear lest we should be repetitious.

3. Another hypothesis imputes the deluge to the sudden elevation of the bottom of the ocean, so as to throw its waters over a part, if not the whole, of existing continents. No fact is more generally admitted by those conversant with geology, than that our present continents once constituted the bottom of the ocean, and that almost equally certain is it, that different continents and different parts of the same continent, were elevated above the waters at different epochs. A distinguished French geologist, who has paid much attention to this point, thinks he can distinguish as many as twelve of these epochs among the rocks of Europe, and there are

several obvious in this country. It is generally admitted, also, that these elevations took place suddenly; that is, they resulted from a paroxysm of internal power. Let us now imagine a continent, or even a single mountain chain, to be raised from the ocean's depths in a few days, or a few weeks. There can be no doubt but the waters would be driven in mighty waves over those continents, or at least over that part of them which was previously above the waters. Suppose, for example, that the bed of the northern ocean were to be thus lifted up over a vast area, by volcanic agency beneath, that is, by the accumulation of vapour and gases beneath the earth's crust. The result would be, that the waters of the northern ocean, with the vast masses of ice there accumulated, would be driven in a southerly direction, at least over the northern hemisphere. After the fractured crust had permitted the pent up gases, vapours, and lava, to escape, it would gradually subside, and thus bring back the diluvial waters to their former beds in a quiet manner; and thus, ere long, all traces of the catastrophe would disappear, unless the aqueous currents should have been powerful enough deeply to denude the surface and transport diluvium and bowlders. Now we know that volcanic power does frequently operate in this very manner. Witness the new island of Sabrina, which, in 1811, was raised near the Azores, and gradually sunk back again after a few days: also, in 1831, the island of Hotham, or Graham, in the Mediterranean, which has also disappeared.

We are not anxious that our readers should believe this to have been the mode in which the Noachian deluge was produced. Our main object is to show that a natural cause exists sufficient to have produced that catastrophe, and thus to take away all improbability respecting the occurrence of such an event from its supposed physical impossibility. This is, however, the hypothesis respecting the cause of the Mosaic deluge, that is now extensively adopted by able geologists. Some have imputed it to the elevation of the Andes, others to that of the Alps. It seems to us, however, that

there is every probability these mountains were raised from the ocean at an earlier period than that of the scriptural deluge; and if the deluge of geology be regarded as identical, the waves produced by the lifting up of those mountains would not have flowed in a direction corresponding to the course which we have shown the waters of that cataclysm to have taken. It is sufficient, however, to show, that geologists in general are now willing to admit that this cause is sufficient to deluge the globe. For, a few years since, it was thought that science could demonstrate the physical impossibility of such an event. We do not contend that this hypothesis is free from difficulties, or that it is to be received as established truth. But we maintain that it is in perfect conformity with the present state of geological science.

Were we disposed to speculate still further, we might suggest, that perhaps in this hypothesis we find a cause for the powerful rain of forty days that accompanied the deluge. For it is well known, that the vast quantities of aqueous vapour that are liberated when a volcano gets vent, sometimes produce long continued drenching rains. If a powerful eruption took place in northern regions, the vapour set free could be rapidly condensed by the cold, and fall in the form of snow or rain, possibly for a period as long as that described by Moses. But we would not lay much stress on this suggestion.

We here close our protracted comparison of the historical and geological deluges. We are aware that we have conducted our readers—if indeed they have not grown weary and abandoned us—through a great deal of what they may consider dry detail. But we have long been satisfied that the superficial and popular view of this subject, which is usually presented, does not bring the true state of the question before the mind, while it tends to prejudice still more against revealed truth, those acute minds who see how shallow and defective is the argument. If any one will thoroughly understand the subject, he must submit to the labour of getting acquainted with the details; and instead of having pre-

sented too many of these for this purpose, we know that our reasoning will often appear obscure and inconclusive, because we have not presented more. We shall now close by presenting a summary of the conclusions at which we have arrived.

We have endeavoured to show, that the traditions found in all ages and in all nations, civilized and savage, respecting deluges, had probably a common origin, viz. the deluge of Noah; though the facts were often blended with the history of local deluges.

We have shown that most extraordinary revolutions of opinion have taken place respecting the geological deluge; and have reduced the opinions of standard writers of the present day on this subject to three classes: first, some deny that any traces of a general deluge exist on the globe: secondly, others admit a general deluge to have taken place, but place the epoch of its occurrence anterior to the creation of man; and thirdly, some not only admit such a catastrophe to have taken place, but suppose it possible it may have been identical with that of Noah.

We have attempted to prove, that those who believe there are at present no traces in nature of Noah's deluge, are not thereby brought into collision with the Bible.

In doing this, we have shown that the organic remains in the secondary and tertiary rocks could not have been deposited there by the Noachian deluge; and that we are to look for the traces of that event only on the surface of the globe. Also, that the Mosaic account does not require us to presume that any marks of that catastrophe would remain to the present time. But yet, that the frequent occurrence of deluges in early times, as shown by geology, furnishes a presumption in favour of that described in Scripture.

We have shown, that there has been a powerful rush of waters over the northern hemisphere, especially America, from the north and north-west, in comparatively modern times; as is proved by the direction in which bowlders and diluvium have been transported, and by

grooves and scratches on the surface of rocks, as well as by denuded vallies of considerable depth.

We have inferred that this geological deluge corresponds with that of Scripture, in having been extensive, if not universal, and in having taken place in comparatively recent times: and that, therefore, it is possible the two deluges may have been identical; though the evidence at present rather preponderates against this opinion.

In considering the objections derived from geology and natural history against the Mosaic account of the deluge, we have concluded that no natural processes have been pointed out on the globe, whose commencement can be proved to have been at an earlier date than that event; though in some instances they might have begun before the flood, and have been since recommenced. Also, that the present state of geological theories renders the submersion of the globe by the flux and reflux of the waters quite possible and probable. Also, that we can explain the existence of the olive in the region of Ararat at the time of the deluge and its subsequent extinction, without resorting to a miracle. Also, that the language of Scripture does not necessarily mean that pairs of all animals on the globe, zoölogically considered, were preserved in the ark; nor that the flood was universal over the globe, but only in the regions where man dwelt; and hence that we are not required to suppose that all animals now on the globe have spread from the regions of Ararat. Also, that there may have been a new creation of many species after the deluge; so that the facts respecting the present distribution of animals does not conflict with the Mosaic account.

Finally, in inquiring whether any natural causes could have produced the deluge, we have shown that of the three hypotheses maintained in modern times on this subject, the sudden elevation of a mountain or continent by internal force, is the only one that can be defended with any plausibility; since the approach of a comet to the earth could have produced no such effect, and the idea that our present continents were raised from

the bottom of the ocean at that time, is contradicted both by Scripture and geology.

If these conclusions be admitted, every reasonable man will allow, that the Mosaic account of the deluge stands forth fairly and fully vindicated from all collision with the facts of science. Nay, a presumption is hence derived in favour of the Mosaic account. We are aware that some will be disappointed if we do not go further, and say that geology strikingly confirms the Mosaic history, as it has been customary to do in most of our popular treatises on the deluge. But we prefer to take our stand on firm ground. And notwithstanding the multiplied evidences of diluvial action which geology presents, the difficulty of identifying these cataclysms with the Noachian deluge is so great in the present state of our knowledge, that it is safer to consider the point as unsettled. Nor is this of much importance, so far as revelation is concerned. The truth and inspiration of the Bible rest on a foundation of evidence, independent of physical science, too deep and firm to need the auxiliary support of geology or natural history. If we can only show that there is no collision between the facts of revelation and those of science, we have done all that is necessary or important. If any remain sceptical after this is done, the cause of their infidelity does not lie in any scientific difficulties, nor in the want of independent evidence to the truth of the holy Scriptures. It is the fruit of a corrupt and unhumbled heart.

JAMES LURNET, Printer, 23 Thistle Street.

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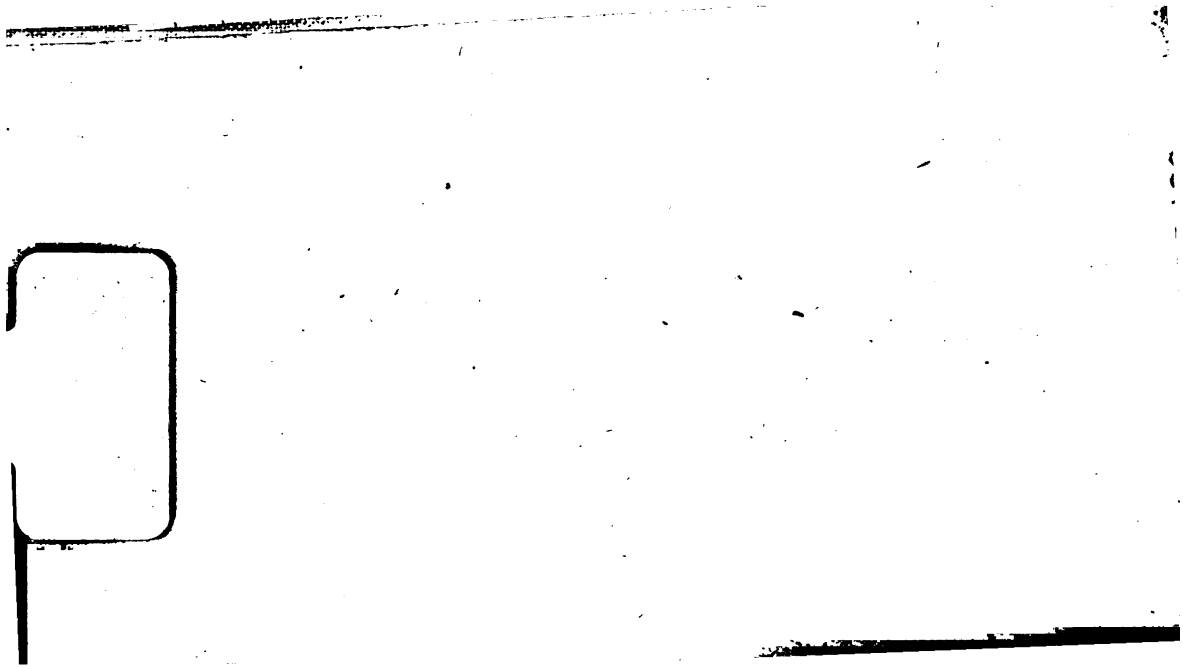
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